ORDER NO. SD8003-1685

Service Manual

Stereo Integrated DC Amplifier

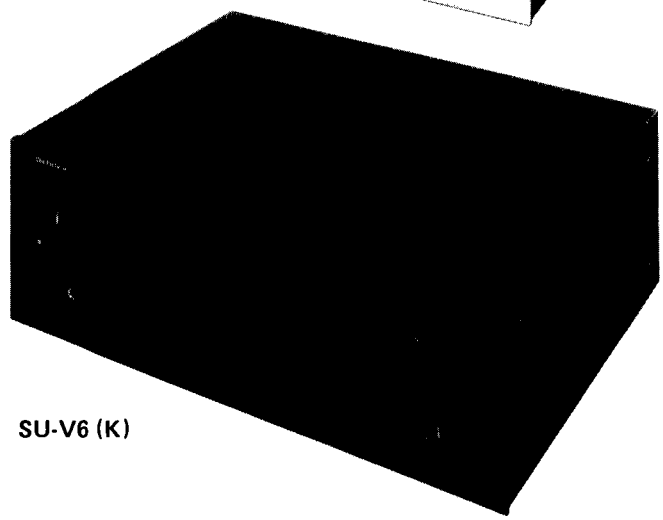
SU-V6

[D], [DG], [EB], [XE], [XSW], [XGH], [XGF], [XAL], [XA]

SU-V6(K)

[D], [DG], [EB], [XE], [XSW], [XGH], [XAL], [XA]

SU-V6



SU-V6 (K)

*** The colors of this model include silver and black. The black type model is provided with (K) in the Service Manual.**

Areas

* [D] and [DG] are available in Scandinavia and European except Belgium, United Kingdom, Switzerland, Holland and France.
* [EB] is available in Belgium.
* [XE] is available in United Kingdom.
* [XSW] is available in Switzerland.
* [XGH] is available in Holland.
* [XGF] is available in France.
* [XAL] is available in Australia.
* [XA] is available in Asia, Latin America, Middle East and Africa.

TECHNNICAL SPECIFICATIONS

Specifications are subject to change without notice for further improvement.

[DIN 45 500]

AMPLIFIER SECTION

20 Hz~20 kHz continuous power output		
both channels driven	2 × 70W (8Ω)	2 × 80W (4Ω)
40 Hz~16 kHz continuous power output		
both channels driven	2 × 70W (8Ω)	2 × 80W (4Ω)
1 kHz continuous power output		
both channels driven	2 × 74W (8Ω)	2 × 90W (4Ω)
Total harmonic distortion		
rated power at 20 Hz~20 kHz		0.02% (4Ω)
		0.007% (8Ω)
rated power at 40 Hz~16 kHz		0.02% (4Ω)
		0.007% (8Ω)
rated power at 1 kHz		0.01% (4Ω)
		0.007% (8Ω)
half power at 20 Hz~20 kHz		0.007% (8Ω)
half power at 1 kHz		0.003% (8Ω)
−26 dB power at 1 kHz		0.05% (4Ω)
50 mW power at 1 kHz		0.08% (4Ω)
Intermodulation distortion		
rated power at 250 Hz: 8 kHz=4:1, 4Ω		0.02%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω		0.007%
Power bandwidth		
both channels driven, −3 dB		
	(THD 0.03%)	5 Hz~60 kHz (4Ω)
	(THD 0.02%)	5 Hz~60 kHz (8Ω)

Residual hum and noise (straight DC)	0.3 mV
Damping factor	30 (4Ω), 60 (8Ω)
Input sensitivity and impedance	
PHONO MM	2.5 mV/47kΩ
MC	170μV/47Ω
TUNER, AUX	150 mV/36kΩ
TAPE 1 REC/PLAY	170 mV/39kΩ
TAPE 2	150 mV/36kΩ
PHONO maximum input voltage (1 kHz, THD 0.01% RMS)	
MM	150 mV
MC	10 mV
S/N	
rated power (4Ω)	
PHONO MM	78 dB (86 dB, IHF, A)
MC	68 dB (68 dB, IHF, A: 250μV input)
TUNER, AUX	92 dB (IHF, A.106 dB)
−26 dB power (4Ω)	
PHONO MM	67 dB
MC	65 dB
TUNER, AUX	68 dB
50 mW power (4Ω)	
PHONO MM	64 dB
MC	62 dB
TUNER, AUX	65 dB

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Frequency response	
PHONO	RIAA standard curve ±0.5 dB (30 Hz~15 kHz)
TUNER, AUX, TAPE (straight DC)	DC~150 kHz (−3 dB) +0 dB, −0.3 dB (20 Hz~20 kHz)
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Subsonic filter	20 Hz, −12 dB/oct.
High-cut filter	7 kHz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage and impedance	
REC OUT	150 mV
TAPE 1 REC/PLAY	30 mV/82kΩ
Channel balance, AUX 250 Hz~6,300 Hz	±1.0 dB
Channel separation, AUX 1 kHz	55 dB
Headphones output level and impedance	560 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

GENERAL

Power consumption	760W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 153 × 351 mm (16-15/16" × 6-1/32" × 13-13/16")
Weight	12.5 kg (27.6 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (HP. 3045 system).

TECHNISCHE DATEN Spezifikationen können infolge von verbesserungen ohne Ankündigung geändert werden.

[DIN 45 500]

VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 80W (4 Ω) 2 × 70W (8 Ω)
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 80W (4 Ω) 2 × 70W (8 Ω)
Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 90W (4 Ω) 2 × 74W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,02% (4 Ω) 0,007% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,02% (4 Ω) 0,007% (8 Ω)
Nennleistung bei 1 kHz	0,01% (4 Ω) 0,007% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,007% (8 Ω)
halbe Nennleistung bei 1 kHz	0,003% (8 Ω)
−26 dB Leistung bei 1 kHz	0,05% (4 Ω)
50 mW Leistung bei 1 kHz	0,08% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,02%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,007%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei −3 dB	
(THD 0.03%)	5 Hz ~ 60 kHz (4 Ω)
(THD 0.02%)	5 Hz ~ 60 kHz (8 Ω)
Restbrumm und Geräusch (straight DC)	0,3 mV
Dämpfungsfaktor	30 (4 Ω), 60 (8 Ω)
Eingangsempfindlichkeit und -impedanz	
Phono - magnetisch (PHONO MM)	2,5 mV/47 kΩ
Phono - dynamisch (PHONO MC)	170 μV/47 Ω
Tuner, Aux	150 mV/36 kΩ
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	170 mV/39 kΩ
Tape 2 (TAPE 2)	150 mV/36 kΩ
Maximale TA-Eingangsspannung (1 kHz, THD 0.01% eff.)	
magnetisch (MM)	150 mV
dynamisch (MC)	10 mV
Frequenzgang	
Phono	RIAA-Standardkurve ±0,5 dB (30 Hz ~ 15 kHz)
Tuner Aux, Tape (straight DC)	DC ~ 150 kHz (−3 dB) +0 dB, −0,3 dB (20 Hz ~ 20 kHz)
Geräuschabstand	
Nennleistung (4 Ω)	
Phono - magnetisch (PHONO MM)	78 dB (86 dB nach IHF, A)
Phono - dynamisch (PHONO MC)	68 dB (68 dB nach IHF, A: 250 μV input)
Tuner, Aux	92 dB (nach IHF, A: 106 dB)
−26 dB Leistung (4 Ω)	
Phono - magnetisch (PHONO MM)	67 dB
Phono - dynamisch (PHONO MC)	65 dB
Tuner, Aux	68 dB
50 mW Leistung (4 Ω)	
Phono - magnetisch (PHONO MM)	64 dB
Phono - dynamisch (PHONO MC)	62 dB
Tuner, Aux	65 dB
Klangregler	
Baßregler (BASS)	50 Hz, +10 dB ~ −10 dB
Höhenregler (TREBLE)	20 kHz, +10 dB ~ −10 dB
Tiefenfilter	20 Hz, −12 dB/Okt.
Rauschfilter	7 kHz, −6 dB/Okt.
Gehörrichtige Lautstärkekorrektur (Loudness)	
(bei −30 dB Ausgangsleistung)	50 Hz, +9 dB
Ausgangsspannung und -impedanz	
Aufnahmeausgang (REC OUT)	150 mV
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	30 mV/82 kΩ
Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)	±1,0 dB
Übersprechdämpfung (Aux, 1 kHz)	55 dB
Kopfhörerpegel und -impedanz	560 mV/330 Ω
Lautsprecherimpedanz	
MAIN oder REMOTE	4 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω

ALLGEMEINE DATEN

Leistungsaufnahme	760 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T)	430 × 153 × 351 mm
Gewicht	12,5 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage HP. 3045) gemessen.

DONNEES TECHNIQUES Sujet à changment sans préaris.

[DIN 45 500]

SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz, les deux canaux en circuit 2 × 80W (4Ω), 2 × 70W (8Ω)

Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit 2 × 80W (4Ω), 2 × 70W (8Ω)

Puissance de sortie continue à 1 kHz les deux canaux en circuit 2 × 90W (4Ω), 2 × 74W (8Ω)

Distorsion harmonique totale

à puissance nominale (20 Hz~20 kHz)	0,02% (4Ω), 0,007% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,02% (4Ω), 0,007% (8Ω)
à puissance nominale (1 kHz)	0,01% (4Ω), 0,007% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,007% (8Ω)
à demi-puissance (1 kHz)	0,003% (8Ω)
puissance de −26 dB à 1 kHz	0,05% (4Ω)
puissance de 50 mW à 1 kHz	0,08% (4Ω)

Distorsion d'intermodulation

à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω 0,02%

à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω 0,007%

Réponse de fréquences

les deux canaux en circuit, −3 dB

(THD 0.03%) 5 Hz~60 kHz (4Ω)

(THD 0.02%) 5 Hz~60 kHz (8Ω)

Bruit et ronflement résiduels (straight DC) 0,3 mV

Coefficient d'amortissement 30 (4Ω), 60 (8Ω)

Sensibilité et impédance d'entrée

PHONO, AIMANT MOBILE (PHONO MM)	2,5 mV/47kΩ
PHONO, BOBINE MOBILE (PHONO MC)	170 μV/47Ω
SYNTONISATEUR, AUX (TUNER, AUX)	150 mV/36kΩ
BANDE 1, ENREGISTREMENT/LECTURE (TAPE 1 REC/PLAY)	170 mV/39kΩ
BANDE 2 (TAPE 2)	150 mV/36kΩ

PHONO (tension d'entrée maximum, 1 kHz RMS THD 0.01%)

AIMANT MOBILE (MM)	150 mV
BOBINE MOBILE (MC)	10 mV

Réponse de fréquence

PHONO Courbe nominale RIAA ±0,5 dB (30 Hz~15 kHz)

SYNTONISATEUR, AUX, BANDE (TUNER, AUX, TAPE) (straight DC) DC~150 kHz (−3 dB), +0 dB, −0,3 dB (20 Hz~20 kHz)

Signal/Bruit

à puissance nominale (4Ω)

PHONO, AIMANT MOBILE (PHONO MM)	78 dB (86 dB, IHF, A)
PHONO, BOBINE MOBILE (PHONO MC)	68 dB (68 dB, IHF, A: 250 μV input)
SYNTONISATEUR, AUX (TUNER, AUX)	92 dB (IHF, A: 106 dB)

puissance de −26 dB (4Ω)

PHONO, AIMANT MOBILE (PHONO MM)	67 dB
PHONO, BOBINE MOBILE (PHONO MC)	65 dB
SYNTONISATEUR, AUX (TUNER, AUX)	68 dB

puissance de 50 mW (4Ω)

PHONO, AIMANT MOBILE (PHONO MM)	64 dB
PHONO, BOBINE MOBILE (PHONO MC)	62 dB
SYNTONISATEUR, AUX (TUNER, AUX)	65 dB

Réglage de la tonalité

BASSES (BASS)	50 Hz, +10 dB~ −10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ −10 dB
Filtre subsonique	20 kHz, −12 dB/oct.
Filtre coupe-hauts	7 Hz, −6 dB/oct.

Compensateur physiologique (volume à −30 dB) 50 Hz, +9 dB

Tension de sortie et impédance

SORTIE ENREGISTREMENT (REC OUT)	150 mV
ENREGISTREMENT/LECTURE BANDE 1 (TAPE 1 REC/PLAY)	30 mV/82 kΩ
Equilibrage des canaux, AUX 250 Hz~6 300 Hz	± 1,0 dB
Séparation des canaux, AUX 1 kHz	55 dB
Niveau de sortie des casques et impédance	560 mV/330Ω

Impédance de charge

PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE) 4Ω~16Ω

PRINCIPALE et AUXILIAIRE (MAIN and REMOTE) 8Ω~16Ω

DIVERS

Consommation	760W
Alimentation	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 153 × 351 mm
Poids	12,5 kg

Remarque:
On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système HP. 3045).

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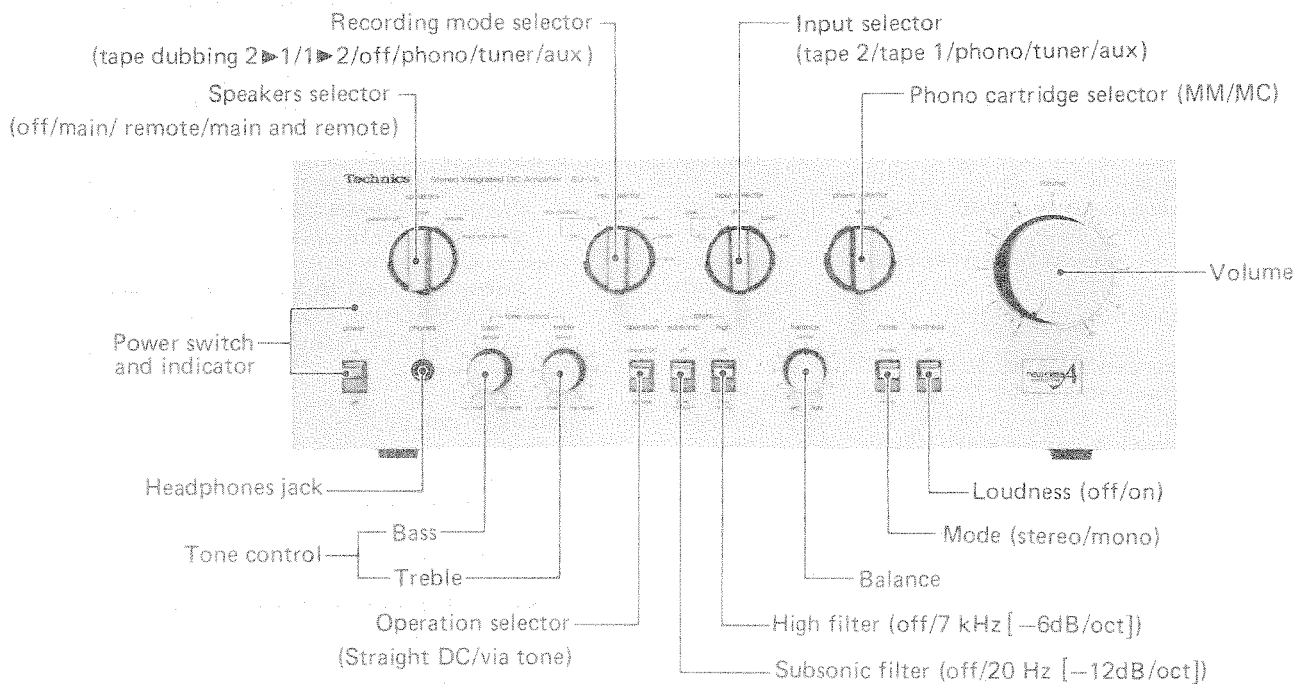
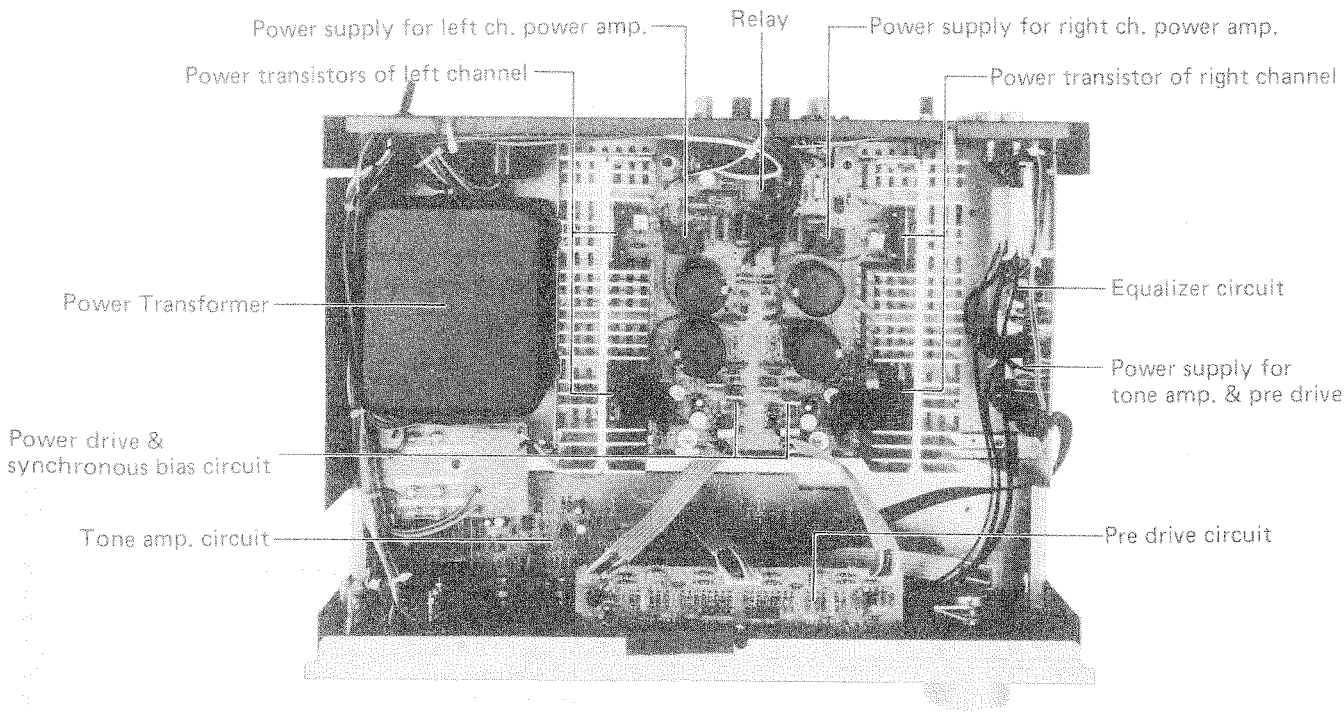
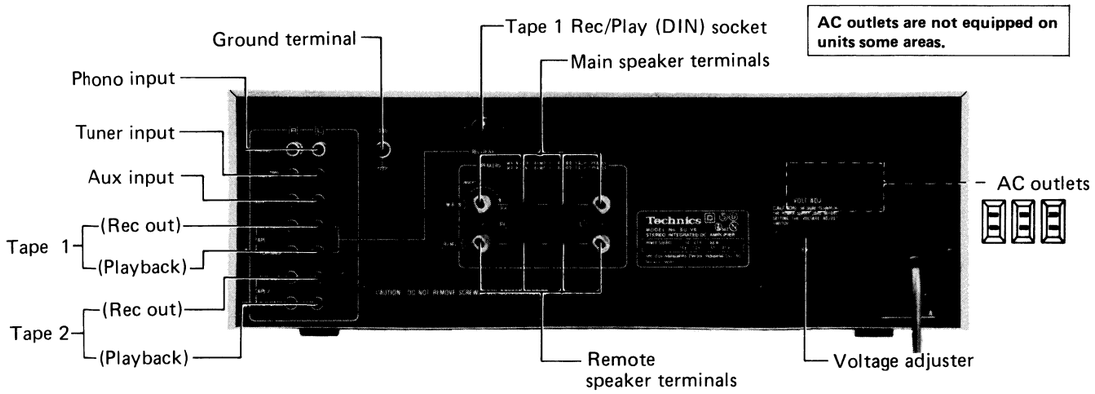
■ LOCATION OF CONTROLS

• Front side view



• Rear side view





■ OUTLINE OF THIS UNIT

In the world of amplifiers, the sound-quality and the output have been the two contradictory concepts. To obtain inproved sound-quality within a limited budget the tendency is to lower the power output, on the other hand, larger output means a sacrifice in sound quality. Therefore, if better sound quality is required, it is beneficial to adopt Class A amplification method, and if large output power is desired, it si wise to select Class B amplification method. This unit has employed the New Class A method to obtain a high output of 70W per channel with a distortion rate of 0.007% (For an 8 ohms load at rated output of 20Hz ~ 20kHz). This low cost stereo integrated amplifier, considering its high output, was developed as a successful combination of fine sound quality and high power output.

• Class B amplification and Class A amplification

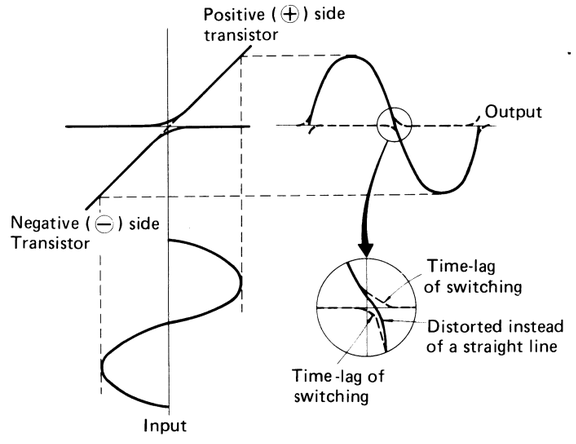
1. Class B amplification

Although Class B amplification has high power efficiency, it invariably introduces switching distortion due to its operating principle. As shwon in Fig. 1, a transistor on the positive (⊕) side amplifies the positive half of the signal, while a transistor on the negative (⊖) side amplifies the negative half of the signal.

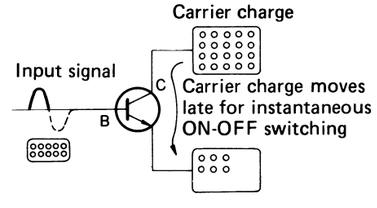
Since only one transistor on either ⊕ or ⊖ side works at any given time, less heat is generated and the power efficiency is higher. However, the switching process is not a smooth one between ⊕ and ⊖ or between ⊖ and ⊕, resulting in distortion. The faster the speed of a signal (higher frequency) is, (as shown in Fig. 2) the more difficult it is for the transistor to catch up instantaneously and the later the carrier charge on the output sides moves (distorted). In recent years, new transistors were developed which can respond to high speeds at high frequencies and which help to improve the distortion greatly though it is difficult to eliminate the distortion completely .

2. Class A amplification

As the transistors on positive (⊕) and negative (⊖) sides amplify signals continuously, switching is not necessary. Accordingly, no switching distortion exists. However, power efficiency becomes very low because this method requires a large current even when there is no signal to be amplified and more heat is generated.



(Operation of Class B amplifier)
Fig. 1



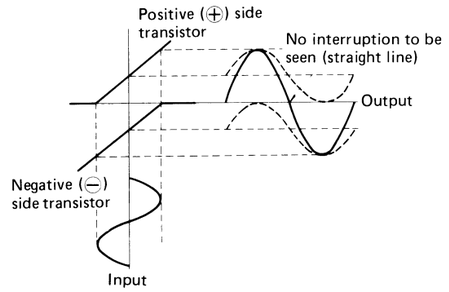
(Transition of electric charge inside the transistor)
Fig.2

• New Class A amplification method

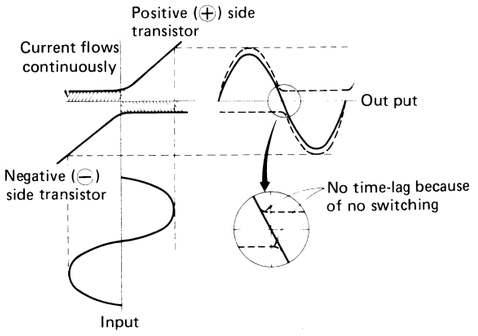
This method combines and utilizes the advantages of Class A, B, or Class AB amplification methods to eliminate distortion and to assure almost equal power efficiency to that of the Class B amplification.

The function of the synchronous bias circuit allows a certain constant flow of current in transistors on the positive (⊕) and negative (⊖) sides, the output transistors are never turned OFF while reproducing any signals, and the distortion caused by switching is therefore eliminated.

Photos 1 ~ 4 show performance comparisons between Class B and the New class A amplifier. Photos 1 and 2 indicate collector current wave forms at their output stages on the positive (⊕) side and negative (⊖) side. (Output transistors are not turned OFF in the case of New Class A.) Output signal wave forms and distortion wave forms are shown in Photos 3 and 4.

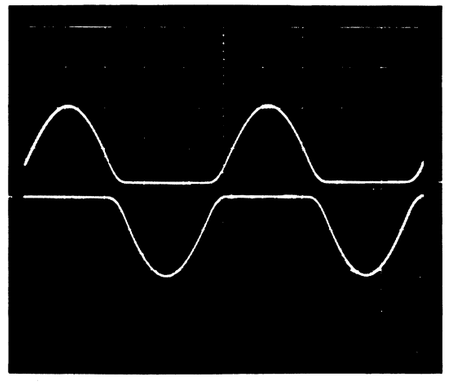


(Operation of Class A amplifier)
Fig. 3

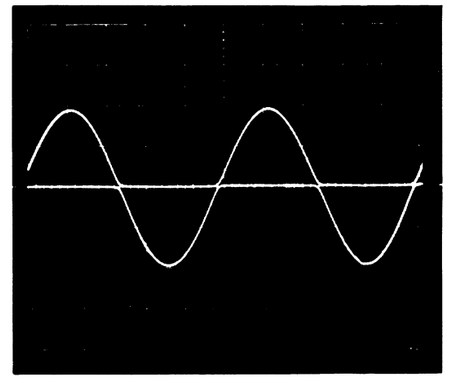


(Operation of New Class A amplifier)
Fig. 4

• Collector current wave forms

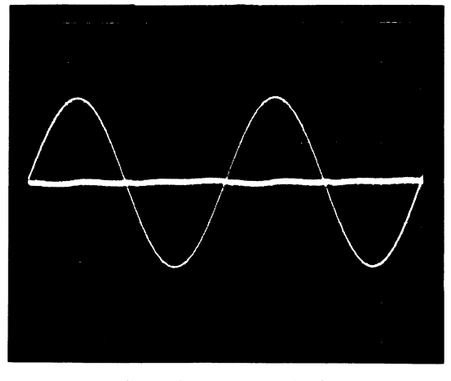


(New Class A amplifier)
Photo 1

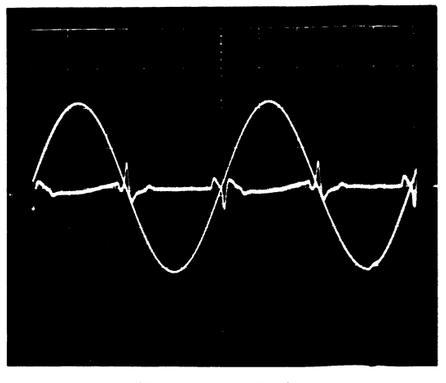


(Class B amplifier)
Photo 2

• Output signal and distortion wave forms



(New Class A amplifier)
Photo 3



(Class B amplifier)
Photo 4

■ TECHNICAL INSTRUCTIONS

The following diagram indicates the synchronous bias circuit of this unit. (The diagram shown is only for the righ channel, but it is identical for the left channel). The first stage consists of a differential circuit (Q306), a current mirror load (Q304) and an emitter follower (Q308). The driver circuit consists of the voltage amplifier stage (Q310) having current stabilizer load (Q312) and the SEPP voltage amplifier stage (Q614, Q616). Its emitter follower output works as a Class A amplifier by bias 1. This in turn is connected to the SEPP final stage of the Darlington output circuit through the synchronous bias circuit by bias 2 and 3. We can consider this a three-stage-Darlington output circuit, where a synchronous bias circuit is inserted between the first SEPP Class A amplifier and the second SEPP stage.
Bias 2 and 3 are the circuits that prevent the output stage on the positive (⊕) side (for bias 2) and on the negative (⊖) side (for bias 3) from turning OFF during the reproduction of any signals. Both operate on fixed current with the voltage set at the value of V_F 2.

- **When no signal exists:**
  The idling current (I_{CQ}) of output transistors (Q622, Q624) is the sum of the current I_{CQ} 1 determined by bias 1 and the current I_{CQ} 2 determined by bias 2 and bias 3.

That is, $I_{CQ} = I_{CQ\ 1} + I_{CQ\ 2}$

where,

$$I_{CQ\ 1} = \frac{V_{F}\ 1 - (V_{BE}\ 1 + V_{BE}\ 2 + V_{BE}\ 3 + V_{BE}\ 4 + V_{BE}\ 5 + V_{BE}\ 6 + V_{D}\ 1 + V_{D}\ 2)}{2R_E}$$

$$I_{CQ\ 2} = \frac{2V_{F}\ 2 - (V_{BE}\ 3 + V_{BE}\ 4 + V_{BE}\ 5 + V_{BE}\ 6 + V_{D}\ 3 + V_{D}\ 4)}{2R_E}$$

- **When signals are applied:**
  When signals swing to the positive (⊕) side, the current Io flows into the output stage (Q622) on the positive (⊕) side, generating a voltage R_E Io at the emitter resistor R_E. This reduces the collector current on the negative (⊖) side of the output stage due to bias 1. Since bias 3 acts as a fixed voltage source, bias is applied to the negative (⊖) side transistors Q620 and Q624, and I_{CQ}2 keeps flowing. That is, the negative (⊖) side output stage continues to operate without being cut-off. When the signals swing to the negative (⊖) side, the positive (⊕) side output stage remains operating in exactly the same way due to bias 2. That is, the signals are reproduced without switching.
  In the synchronous bias circuit, high speed diodes which can follow precisely and correctly the high frequency signals are used for D610 and D612 where the signals pass through and for D614 and D616 where the current flows to pass the signals without switching at the time of signal reproduction.

- **Operational check of synchronous bias circuit**
  To check the operation of the synchronous bias circuit:
  1. Measure the emitter current with an oscilloscope connected to the emitter of output transistor.
  2. Turn the bias 2 and bias 3 (R659 in left channel; R660 in right channel), then the operation is normal if I_{CQ} 2 operates.
  3. If the circuits of bias 2 and 3 are not in operation, the operation will be the same as in a conventional Class B amplifier where switching distortion is generated.

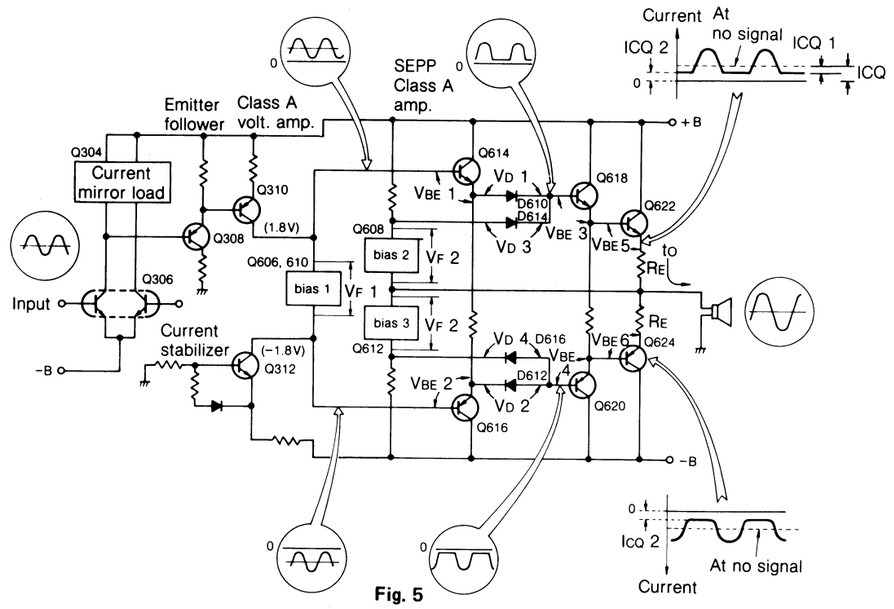


Fig. 5

■ ADJUSTING INSTRUCTIONS — ENGLISH

- **Setting of controls and instruments to be used**
  1. Operation switch . . . . . straight DC
  2. Speaker switch . . . . . .main
  3. Sound volume . . . . . .0 (minimum)
  4. DC voltmeter (capable to measure 5mV)

No.	Adjustments	DC Voltmeter Connections	Adjusting Point	Adjustment Procedure
1	DC Balance	L channel Between TP602 and ground	R353	• Adjust R353 to obtain a minimum reading, using the 100mV range on the DC voltmeter (within ±10mV) • Cut off the jumper wire (J301) if adjustment is not possible.
2		R channel Between TP604 and ground	R354	• Adjust R354 to obtain a minimum reading, using the 100mV range on the DC voltmeter. • Cut off the jumper wire (J302) if adjustment is not possible.
3	Clamp Voltage	L channel Between TP605 and TP602 (minus probe) R channel Between TP604 and TP603 (minus probe)	R659 (L channel) R660 (R channel)	• Turn I_{CQ} semi-fixed resistors R657, 658 to minimum. (counter-clockwise direction) • Adjust R659 (Lch) and R660 (Rch) to approx. 1mV after ten minutes warm-up time.
4	I_{CQ} (Adjustment using a DC voltmeter)	L channel Between TP605 and TP602 (minus probe) R channel Between TP604 and TP603 (minus probe)	R657 (L channel) R658 (R channel)	• Adjust R657 (L ch) and R658 (R ch) to approx. 10 ~ 15mV after ten minutes warm-up time.

- **I_{CQ} can be adjusted with oscilloscope and the distortion analyser.**

Instruments to be used
1. Oscillator (20kHz sine wave)
2. Distortion analyser
3. Oscilloscope

1st Feed 20kHz sine wave into the TUNER or AUX terminals.
2nd Volume control to maximum of this unit.
3rd Connect the distortion analyser to the speaker terminals and connect the output from the distortion analyser to the vertical input of the oscilloscope.
4th Turn the oscillator attenuater so that the output at the speaker terminal reaches 16V.
5th Adjust the I_{CQ} semi-fixed resistors R657 (left channel), R658 (right channel) for minimum distortion on the oscilloscope.

■ EINSTELLUNGSANWEISUNGEN ——— DEUTSCH

● Einstellung der zu benutzenden Regler und Instrumente

1. Betriebsschalter. . . . . .Gleichstrom (direkt)
2. Lautsprecherschalter . . .Hauptlautsprecher ("main")
3. Lautstärke . . . . . ."0" (Minimalstellung)
4. Gleichstromvoltmeter. . 5mV Meßbereich erforderlich.

Nr.	Einstellungen	Gleichstromvoltmeterverbindungen	Einstellungspunkte	Einstellungsvorgang
1	Gleichstrom-balance	L-Kanal. Zwischen TP602 und Masse.	R353	* Durch Benutzung des 100mV-Bereiches (innerhalb von ± 10mV) des Gleichstrom-voltmeters, den regelbaren Widerstand R353 auf minimalen Wert einstellen. * Wenn eine Einstellung nicht möglich ist, die Schaltader (J301) abtrennen.
2		R-Kanal. Zwischen TP604 und Masse.	R354	* Durch Benutzung des 100mV-Bereiches (innerhalb von ± 10mV) des Gleichstrom-voltmeters, den regelbaren Widerstand R354 auf minimalen Wert einstellen. * Wenn eine Einstellung nicht möglich ist, die Schaltader (J302) abtrennen.
3	Klemmspann-ung	L-Kanal. Zwischen TP605 und TP602 (Minustest) R-Kanal. Zwischen TP604 und TP603 (Minustest)	R659 (L-Kanal) R660 (R-Kanal)	* Die Icq halbfesteingestellten Widerstände R657 und R658 auf Minimalstellung drehen. (Entgegen dem Uhrzeigersinn) * R659 (L-Kanal) und R660 (R-Kanal) auf ungefähr 1mV, nach 10 Minuten Anwärmezeit, einstellen.
4	Icq (Einstellungen mit einem Gleichstrom-voltmeter)	L-Kanal. Zwischen TP605 und TP602 (Minustest) R-Kanal. Zwischen TP604 und TP603 (Minustest)	R657 (L-Kanal) R658 (R-Kanal)	* R657 (L-Kanal) und R658 (R-Kanal) auf ungefähr 10 ~ 15mV, nach 10 Minuten Anwärmezeit, einstellen.

● Icq Kann mit einem Oszilloskop und dem Verzerrungsanalyser eingestellt werden.

Zu benutzende Instrumente
1. Schwingungserreger (20kHz sinus)
2. Verzerrungsanalyser
3. Oszilloskop

Erster Schritt: Die 20kHz Sinuswelle in die TUNER-oder AUX-Buchsen eingeben.

Zweiter Schritt: Den Lautstärkeregler dieses Gerätes auf Maximalstellung bringen.

Dritter Schritt: Den Verzerrungsanalyser mit den Lautsprecherklemmen verbinden, und den Ausgang des Verzerrungsanalysers mit dem Vertikaleingang des Oszilloskops verbinden.

Vierter Schritt: Den Eichungsregler des Oszilloskops auf eine Weise regeln, daß der Ausgang der Lautsprecherklemmen auf 16Volt kommt.

Fünfter Schritt: Den Icq halbeinstellbaren Widerstand R657 (L-Kanal) und R658 (R-Kanal), auf minimale Verzerrungsanzeige dem Oszilloskop einstellen.

■ INSTRUCTIONS DE REGLAGE ——— FRANÇAIS

● Réglage des commandes et instruments à utiliser

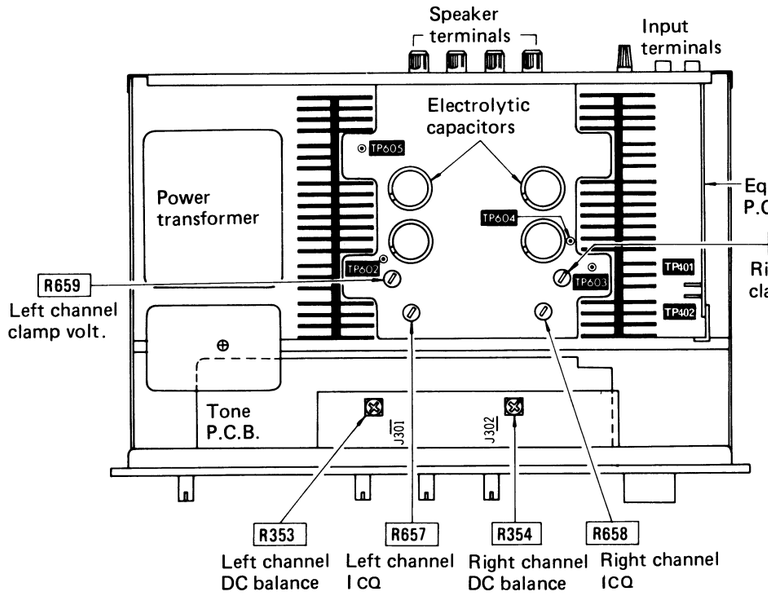
1. Commutateur de marche/arrêt . . . . . .CC direct
2. Commutateur du haut-parleur . . . . . .Principal
3. Volume du son . . . . . .0 (minimum)
4. Voltmètre CC (pouvant mesurer 5mV)

No.	Réglages	Connexions du voltmetre CC	Point de réglage	Procédé de réglage
1	Equilibre CC	Canal gauche Entre TP602 et la masse	R353	* Régler R353 pour obtenir une lecture minimale, à l'aide de la gamme de 100mV sur le voltmètre CC (avec ± 10mV) * Couper le fil volant (J301) si le réglage est impossible.
2		Canal droite Entre TP604 et la masse	R354	* Régler R354 pour obtenir une lecture minimale, à l'aide de la gamme de 100mV sur le voltmètre CC (avec ± 10mV) * Couper le fil volant (J302) si le réglage est impossible.
3	Tension de blocage	Canal G. Entre TP605 et TP602 (sonde au moins) Canal D. Entre TP604 et TP603 (sonde au moins)	R659 (Canal G) R660 (Canal D)	* Tourner les résistances R657, 658 semi-fixes Icq sur le minimum. (à gauche) * Régler R659 (canal gauche) et R650 (canal droit) sur env. 1mV après 10 minutes de temps de chauffage.
4	Icq (réglage à l'aide d'un voltmètre CC)	Canal G. Entre TP605 et TP602 (sonde au moins) Canal D Entre TP604 et TP603 (sonde au moins)	R657 (Canal G) R658 (Canal D)	* Régler les R657 (canal gauche) et R658 (canal droit) sur env. 10 ~ 15mV après 10 mn. de prèchauffage.

● Icq peut être réglé à l'aide d'un oscilloscope et un analyseur de distorsion.

Instruments à utiliser
1. Oscillateur (onde sinusoîdale de 20kHz)
2. Analyseur de distorsion
3. Oscilloscope

1. Alimenter une onde sinusoîdale de 20kHz aux bornes TUNER et AUX.
2. Placer la commande de volume, sur le maximum de cet appareil.
3. Brancher l'analyseur de distorsion aux bornes du haut-parleur et brancher la sortie de l'analyseur de distorsion à l'entrée verticale de l'oscilloscope.
4. Tourner l'atténuateur de l'oscillateur de telle sorte que la sortie à la borne du haut-parleur, atteigne 16V.
5. Régler les résistances R657 (canal gauche) et R658 (canal droit) semi-fixes Icq sur la distorsion minimale de l'oscilloscope.

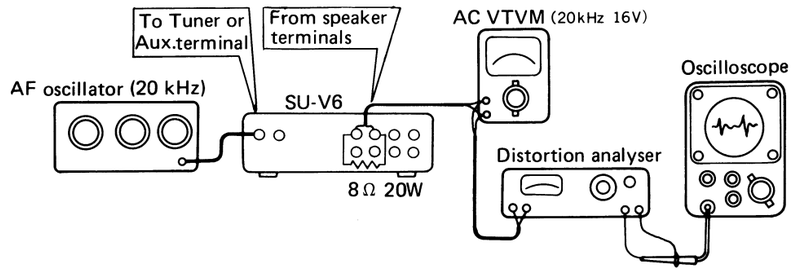


DC voltage at TP401 is between −14.5V and −17.5V.

DC voltage at TP402 is between 14.5V and 17.5V.

(Gleichstromspannung am Testpunkt TP401 zwischen −14.5V und −17.5V.
Gleichstromspannung am Testpunkt TP402 zwischen 14.5V und 17.5V.)
(La tension CC à TP401 est entre −14.5V et −17.5V.
La tension CC à TP402 est entre 14.5V et 17.5V.)

Fig. 6



(I CQ adjustment with the oscilloscope and the distortion analyser)
(Icq-Einstellung mit Oszilloskop und Verzerrungsanalyser)
(Réglage de Icq à l'aide de l'oscilloscope et de l'analyseur de distorsion.)

Fig. 7

■ BEFORE STARTING THE REPAIRING

Before adjusting or repairing, be sure to short-circuit opposite poles of the 8200μF capacitors (C405~408) with a resistor approximately of "50Ω, 5W" for discharging the charged voltage.
Short-circuiting with a screw driver and the like is not only dengerous, but may destroy transistors and diodes, and should therefore be avoided.

■ DISASSEMBLY INSTRUCTIONS

- **To remove power Transistor** (example: left channel)
  1. Unsolder Power Transistor.
  2. Loosen two screws (① and ② as shown in Fig. 8) which hold the heat sink onto the foil side of the P C B.
  3. Loosen plastic revets which hold the bias circuit PCB's (Q605, 607, 609 and 611) to the heat sink. The PCB's are about 1" x 1.5"(25 x 35mm) insize.
  4. Lift the heat sink from the chassis and loosen two screws to remove the power transistor.
  5. When replacing the transistor, apply silicone grease to the bottom of the transistor and reverse the procedure (steps 4 through 1).

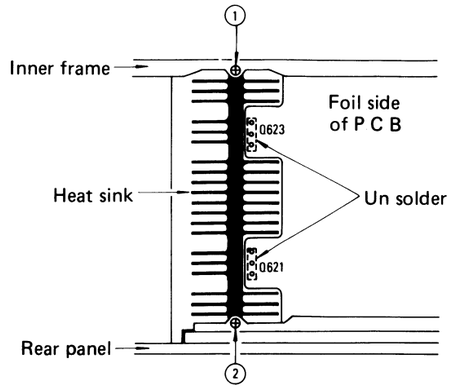


Fig. 8

- **To remove the remote control switch band**
  1. Press the band with a screw driver in the direction shown in Fig. 9.
  2. Remove the band, first at point Ⓐ as shown in Fig. 10. (Care should be taken not to hold Ⓒ in Fig. 9.)
  3. Then remove the band at point Ⓑ.
  4. When re-attaching the band start at point Ⓑ.

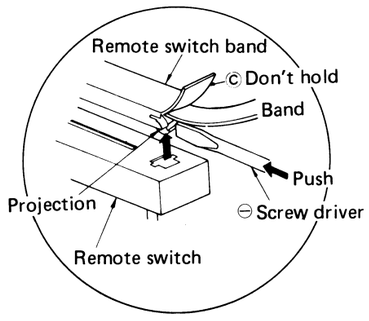


Fig. 9

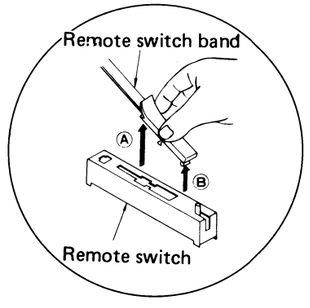
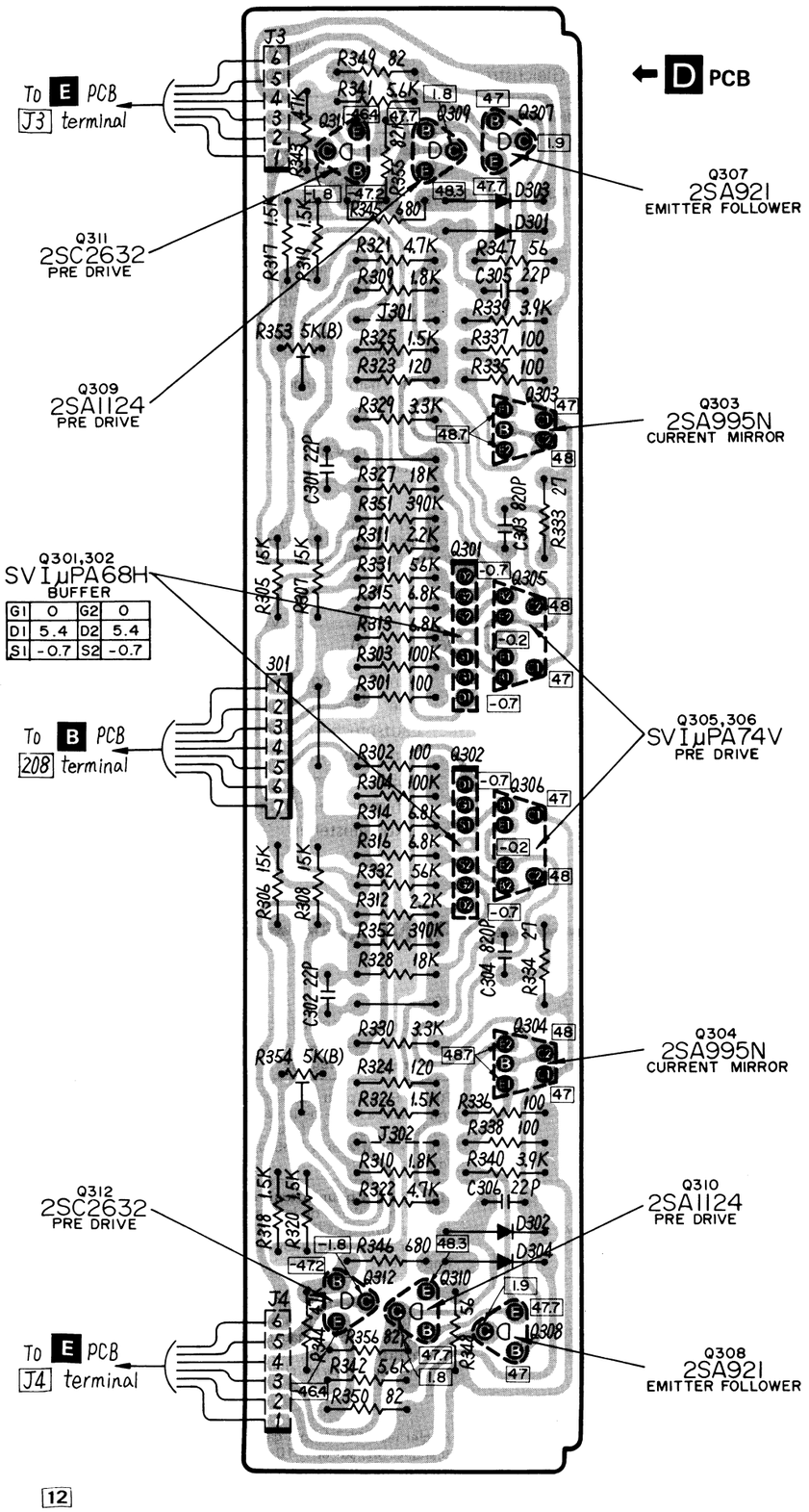
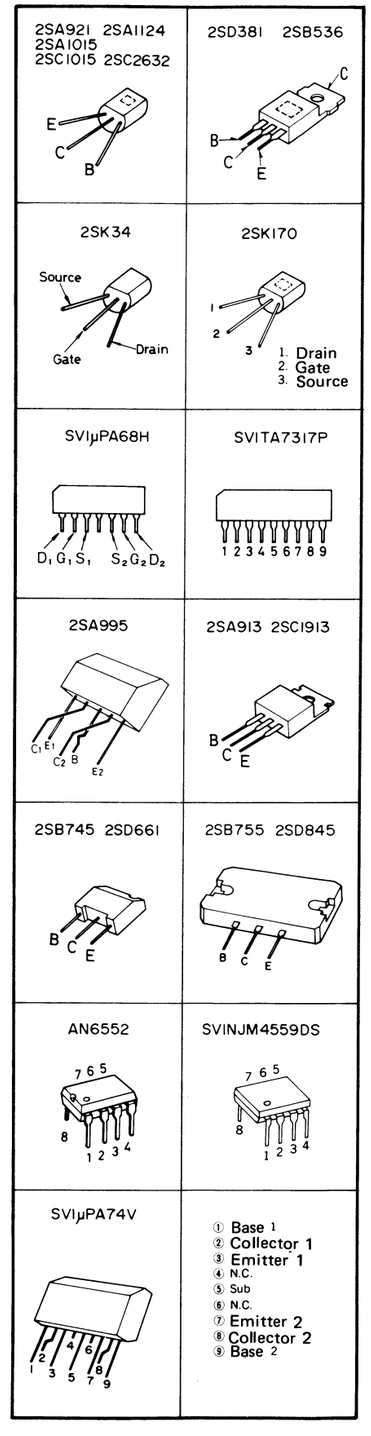


Fig. 10

■ PRINTED CIRCUIT BOARD (D Pre drive circuit)



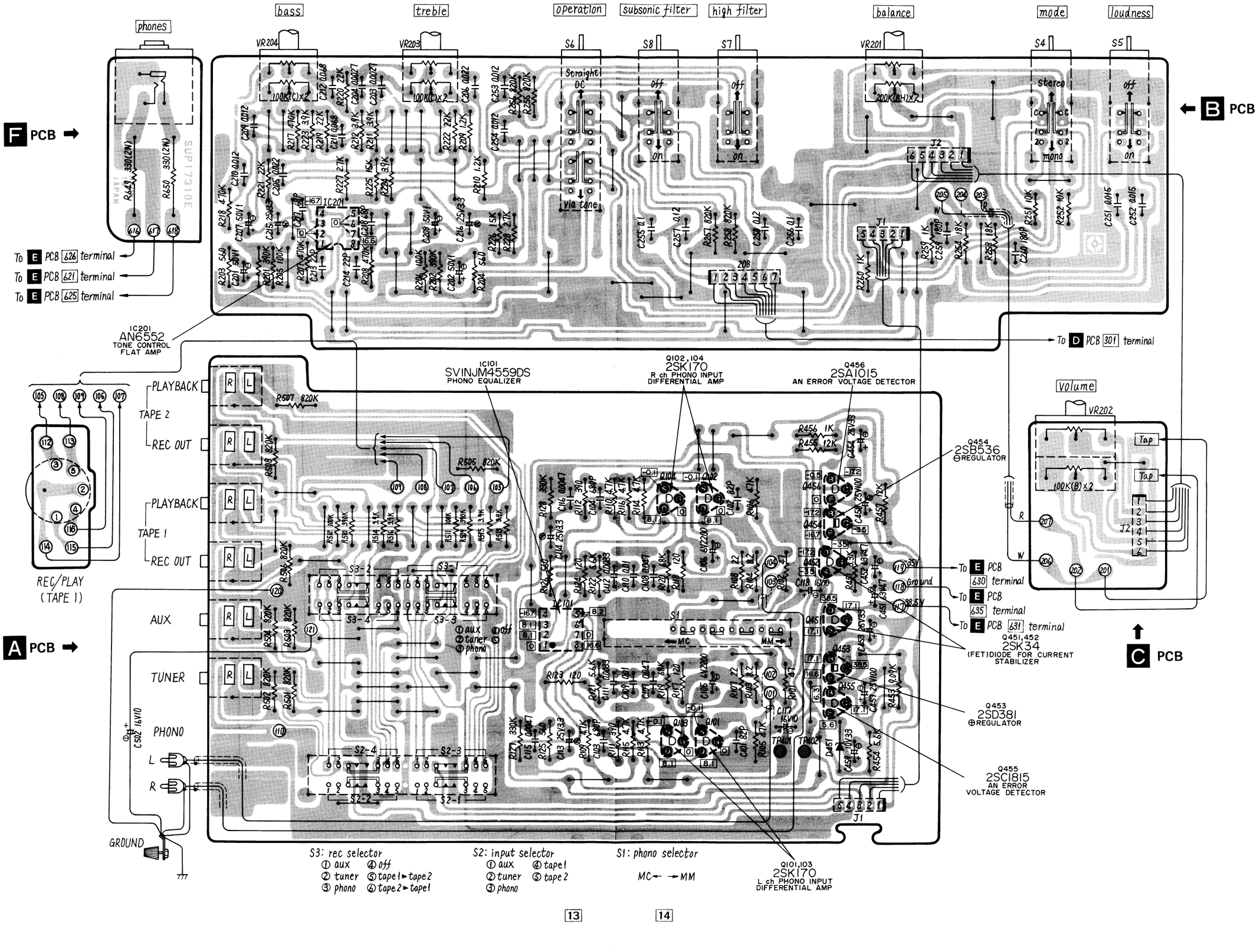
• Terminal guide of transistors and IC's



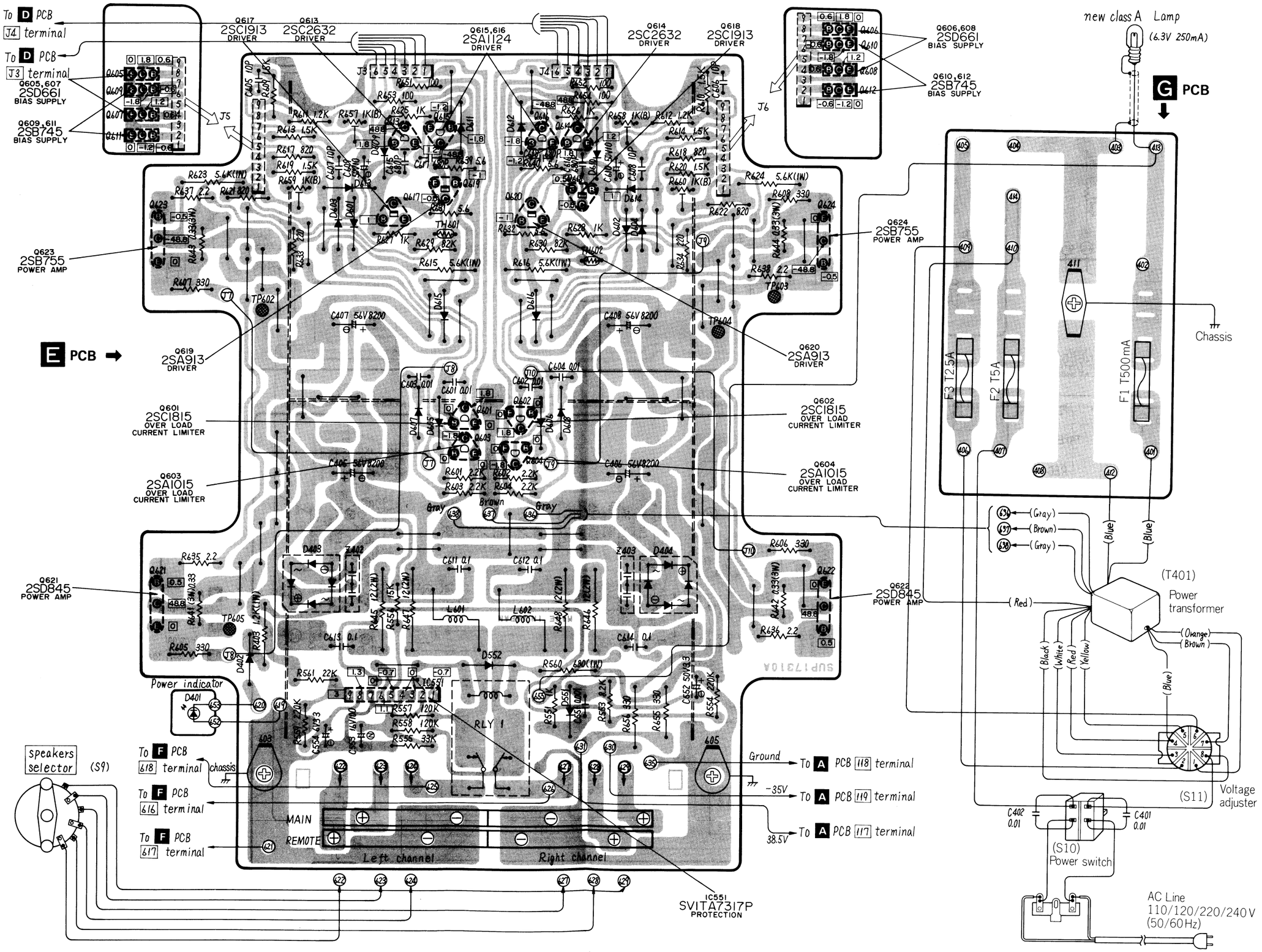
■ PRINTED CIRCUIT BOARD

(A Equalizer/Voltage regulator, B Tone control, C Volume control, F Headphone circuit)

Ground (Earth) circuit



■ PRINTED CIRCUIT BOARD (E Power amplifier drive & synchronous bias circuits, G Power source fuse)



■ RESISTOR AND CAPACITOR PARTS LIST

Note: ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.		Part No.	Part Name & Description
RESISTORS			
R101, 102		**ERO25CKF47R0**	Metal Film, 47Ω, 1/4W, ± 1%
R103, 104		**ERD25FJ8R2**	Carbon, 8.2Ω, 1/4W, ± 5%
R105, 106		**ERO25CKF4702**	Metal Film, 47kΩ, 1/4W, ± 1%
R107, 108		**ERO25CKF22R1**	Metal Film, 22.1Ω, 1/4W, ± 1%
R109, 110		**ERO25CKF4701**	Metal Film, 4.7kΩ, 1/4W, ± 1%
R111, 112		**ERD25FJ391**	Carbon, 390Ω, 1/4W, ± 5%
R113, 114		**ERO25CKF4701**	Metal Film, 4.7kΩ, 1/4W, ± 1%
R115, 116		**ERO25CKF4701**	Metal Film, 4.7kΩ, 1/4W, ± 1%
R117, 118		**ERO25CKF1200**	Metal Film, 120Ω, 1/4W, ± 1%
R119, 120		**ERO25CKF6802**	Metal Film, 68kΩ, 1/4W, ± 1%
R121, 122		**ERO25CKF5601**	Metal Film, 5.6kΩ, 1/4W, ± 1%
R123, 124		**ERO25CKF1200**	Metal Film, 120Ω, 1/4W, ± 1%
R125, 126		**ERD25FJ561**	Carbon, 560Ω, 1/4W, ± 5%
R127, 128		**ERD25TJ334**	Carbon, 330kΩ, 1/4W, ± 5%
R201, 202		**ERD25TJ394**	Carbon, 390kΩ, 1/4W, ± 5%
R203, 204		**ERD25FJ561**	Carbon, 560Ω, 1/4W, ± 5%
R205, 206		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R207, 208		**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ± 5%
R209, 210		**ERD25FJ122**	Carbon, 1.2kΩ, 1/4W, ± 5%
R211, 212		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R217, 218		**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ± 5%
R219, 220		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R221, 222		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R223, 224		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R225, 226		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R227, 228		**ERD25FJ272**	Carbon, 2.7kΩ, 1/4W, ± 5%
R251, 252		**ERD25FJ103**	Carbon, 10kΩ, 1/4W, ± 5%
R253, 254		**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R255, 256		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R257, 258		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R259, 260		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R301, 302		**ERD25FJ101**	Carbon, 100Ω, 1/4W, ± 5%
R303, 304,		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R305, 306		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R307, 308		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R309, 310		**ERD25FJ182**	Carbon, 1.8kΩ, 1/4W, ± 5%
R311, 312		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R313, 314		**ERO25CKF6801**	Metal Film, 6.8kΩ, 1/4W, ± 1%
R315, 316		**ERO25CKF6801**	Metal Film, 6.8kΩ, 1/4W, ± 1%
R317, 318		**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R319, 320		**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R321, 322		**ERD25FJ472**	Carbon, 4.7kΩ, 1/4W, ± 5%
R323, 324		**ERO25CKF1200**	Metal Film, 120Ω, 1/4W, ± 1%
R325, 326		**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R327, 328		**ERD25FJ183**	Carbon, 18kΩ, 1/4W, ± 5%
R329, 330		**ERO25CKF3301**	Metal Film, 3.3kΩ, 1/4W, ± 1%
R331, 332		**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ± 5%
R333, 334		**ERD25FJ270**	Carbon, 27Ω, 1/4W, ± 5%
R335, 336	⚠	**ERD25FJ101**	Carbon, 100Ω, 1/4W, ± 5%
R337, 338	⚠	**ERD25FJ101**	Carbon, 100Ω, 1/4W, ± 5%
R339, 340		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R341, 342		**ERD25FJ562**	Carbon, 5.6kΩ, 1/4W, ± 5%
R343, 344		**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ± 5%
R345, 346	⚠	**ERD25FJ681**	Carbon, 680Ω, 1/4W, ± 5%
R347, 348	⚠	**ERD25FJ560**	Carbon, 56Ω, 1/4W, ± 5%
R349, 350	⚠	**ERD25FJ820**	Carbon, 82Ω, 1/4W, ± 5%
R351, 352		**ERD25TJ394**	Carbon, 390kΩ, 1/4W, ± 5%
R355, 356		**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ± 5%
R403		**ERG1ANJ122**	Metal Oxide, 1.2kΩ, 1W, ± 5%
R451		**ERD25FJ332**	Carbon, 3.3kΩ, 1/4W, ± 5%
R453		**ERO25CKF9091**	Metal Film, 9.09kΩ, 1/4W, ± 1%
R454		**ERO25CKF5601**	Metal Film, 5.6kΩ, 1/4W, ± 1%
R455		**ERO25CKF1202**	Metal Film, 12kΩ, 1/4W, ± 1%
R456		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R457		**ERO25CKF1202**	Metal Film, 12kΩ, 1/4W, ± 1%
R501, 502		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R503, 504		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R505, 506		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R507, 508		**ERD25TJ824**	Carbon, 820kΩ, 1/4W, ± 5%
R509, 510		**ERD25TJ394**	Carbon, 390kΩ, 1/4W, ± 5%
R511, 512		**ERD25TJ104**	Carbon, 100kΩ, 1/4W, ± 5%
R513, 514		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R515, 516		**ERD25FJ392**	Carbon, 3.9kΩ, 1/4W, ± 5%
R551		**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R553		**ERD25FJ822**	Carbon, 8.2kΩ, 1/4W, ± 5%
R554		**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ± 5%
R555		**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ± 5%
R556		**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ± 5%
R557, 558		**ERD25TJ124**	Carbon, 120kΩ, 1/4W, ± 5%
R559		**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ± 5%
R560		**ERG1ANJ681**	Metal Oxide, 680Ω, 1W, ± 5%
R561		**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ± 5%
R601, 602		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R603, 604		**ERD25FJ222**	Carbon, 2.2kΩ, 1/4W, ± 5%
R605, 606	⚠	**ERD25FJ331**	Carbon, 330Ω, 1/4W, ± 5%
R607, 608	⚠	**ERD25FJ331**	Carbon, 330Ω, 1/4W, ± 5%
R609, 610	⚠	**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R611, 612	⚠	**ERD25FJ122**	Carbon, 1.2kΩ, 1/4W, ± 5%
R613, 614	⚠	**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R615, 616		**ERG1ANJ562**	Metal Oxide, 5.6kΩ, 1W, ± 5%
R617, 618	⚠	**ERD25FJ821**	Carbon, 820Ω, 1/4W, ± 5%
R619, 620	⚠	**ERD25FJ152**	Carbon, 1.5kΩ, 1/4W, ± 5%
R621, 622	⚠	**ERD25FJ821**	Carbon, 820Ω, 1/4W, ± 5%
R623, 624		**ERG1ANJ562**	Metal Oxide, 5.6kΩ, 1W, ± 5%
R625, 626	⚠	**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R627, 628	⚠	**ERD25FJ102**	Carbon, 1kΩ, 1/4W, ± 5%
R629, 630		**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ± 5%
R631, 632	⚠	**ERD25FJ5R6**	Carbon, 5.6Ω, 1/4W, ± 5%
R633, 634	⚠	**ERD25FJ221**	Carbon, 220Ω, 1/4W, ± 5%
R635, 636	⚠	**ERD25FJ2R2**	Carbon, 2.2Ω, 1/4W, ± 5%
R637, 638	⚠	**ERD25FJ2R2**	Carbon, 2.2Ω, 1/4W, ± 5%
R639, 640	⚠	**ERD25FJ5R6**	Carbon, 5.6Ω, 1/4W, ± 5%
R641, 642	⚠	ERF3RKR33	Non-Flammable, 0.33Ω, 3W, ±10%
R643, 644	⚠	ERF3RKR33	Non-Flammable, 0.33Ω, 3W, ±10%
R645, 646		**ERG2ANJ120**	Metal Oxide, 12Ω, 2W, ± 5%
R647, 648		**ERG2ANJ120**	Metal Oxide, 12Ω, 2W, ± 5%
R649, 650		**ERG2ANJ331**	Metal Oxide, 330Ω, 2W, ± 5%
R651, 652	⚠	**ERQ12HJ101**	Fuse Type Metallic, 100Ω, 1/2W, ± 5%
R653, 654	⚠	**ERD25FJ101**	Carbon, 100Ω, 1/4W, ± 5%
R655, 656	⚠	**ERQ12HJ331**	Fuse Type Metallic, 330Ω, 1/2W, ± 5%
CAPACITORS			
C101, 102		ECCD1H820K	Ceramic, 82pF, 50V, ±10%
C103, 104		ECKD1H681KB	Ceramic, 680pF, 50V, ±10%
C105, 106		**ECEA0JS222**	Electrolytic, 2200μF, 6.3V
C107, 108		ECQM1H473JZ	Polyester, 0.047μF, 50V, ± 5%
C109, 110		ECQM1H103JZ	Polyester, 0.01μF, 50V, ± 5%
C111, 112		ECQM1H332KZ	Polyester, 0.0033μF, 50V, ±10%
C113, 114	⚠	**ECEA25N3R3**	Non-Polar Electrolytic, 3.3μF, 25V
C115, 116		ECQM1H472KZ	Polyestor, 0.0047μF, 50V, ±10%
C117, 118		**ECEA1HS100**	Electrolytic, 10μF, 50V
C201, 202		**ECEA50M1R**	Electrolytic, 1μF, 50V
C203, 204		ECQM1H272KZ	Polyester, 0.0027μF, 50V, ±10%
C205, 206		ECQM1H223KZ	Polyester, 0.022μF, 50V, ±10%
C207, 208		**ECEA50Z1**	Electrolytic, 1μF, 50V
C209, 210		ECQM1H123KZ	Polyester, 0.012μF, 50V, ±10%
C211, 212		ECQM1H683KZ	Polyester, 0.068μF, 50V, ±10%
C213, 214		ECCD1H220K	Ceramic, 22pF, 50V, ±10%
C215, 216	⚠	**ECEA25N3R3**	Non-Polar Electrolytic, 3.3μF, 25V
C217, 218		ECCD1H680K	Ceramic, 68pF, 50V, ±10%
C251, 252		ECQM1H153KZ	Polyester, 0.015μF, 50V, ±10%
C253, 254		ECQM1H123KZ	Polyester, 0.012μF, 50V, ±10%
C255, 256		ECQM1H104KZ	Polyester, 0.1μF, 50V, ±10%
C257, 258		ECQM1H124KZ	Polyester, 0.12μF, 50V, ±10%
C259, 260		ECCD1H181K	Ceramic, 180pF, 50V, ±10%
C301, 302		ECCD1H220K	Ceramic, 22pF, 50V, ±10%
C303, 304		ECKD1H821KB	Ceramic, 820pF, 50V, ±10%
C305, 306		ECCD2H220K	Ceramic, 22pF, 500V, ±10%
C401, 402	⚠	ECKDKC103PF	Ceramic, 0.01μF, 400VAC, $^{+100}_{-0}$%
C403 [XA] only	⚠	ECKDKC103PF	Ceramic, 0.01μF, 400VAC, $^{+100}_{-0}$%
C405, 406		ECETS56V822U	Electrolytic, 8200μF, 56V
C407, 408		ECETS56V822U	Electrolytic, 8200μF, 56V
C451, 452		**ECEA1JS4R7**	Electrolytic, 4.7μF, 63V
C453, 454		**ECEA1VS330**	Electrolytic, 33μF, 35V
C457, 458		**ECEA1ES101**	Electrolytic, 100μF, 25V
C459		**ECEA1CS330**	Electrolytic, 33μF, 16V
C502		**ECEA1HS100**	Electrolytic, 10μF, 50V
C551		ECKD1H102MD	Ceramic, 0.001μF, 50V, ±20%
C552		**ECEA50Z3R3**	Elecrtolytic, 33μF, 50V
C553	⚠	**ECEA16N100**	Non-Polar Electrolytic, 100μF, 16V
C554		**ECEA1CS330**	Electrolytic, 3.3μF, 16V
C601, 602		ECKD1H103MD	Ceramic, 0.01μF, 50V, ±20%
C603, 604		ECKD1H103MD	Ceramic, 0.01μF, 50V, ±20%
C605, 606		ECCD1H100K	Ceramic, 10pF, 50V, ±10%
C607, 608		ECCD1H100K	Ceramic, 10pF, 50V, ±10%
C609, 610		**ECEA1HS100**	Electrolytic, 10μF, 50V
C611, 612		ECQM1H104KZ	Polyester, 0.1μF, 50V, ±10%
C613, 614		ECQM1H104KZ	Polyester, 0.1μF, 50V, ±10%
C615, 616		ECKD1H681KB	Ceramic, 680pF, 50V, ±10%
C617, 618		ECKD1H681KB	Ceramic, 680pF, 50V, ±10%

■ REPLACEMENT PARTS LIST.....Electric Parts

Notes:
1. Part numbers are indicated on most mechanical parts Please ust this part number of rparts orders.
2. ⚠ indicates that only parts specified by the manufacturer be used for safety.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

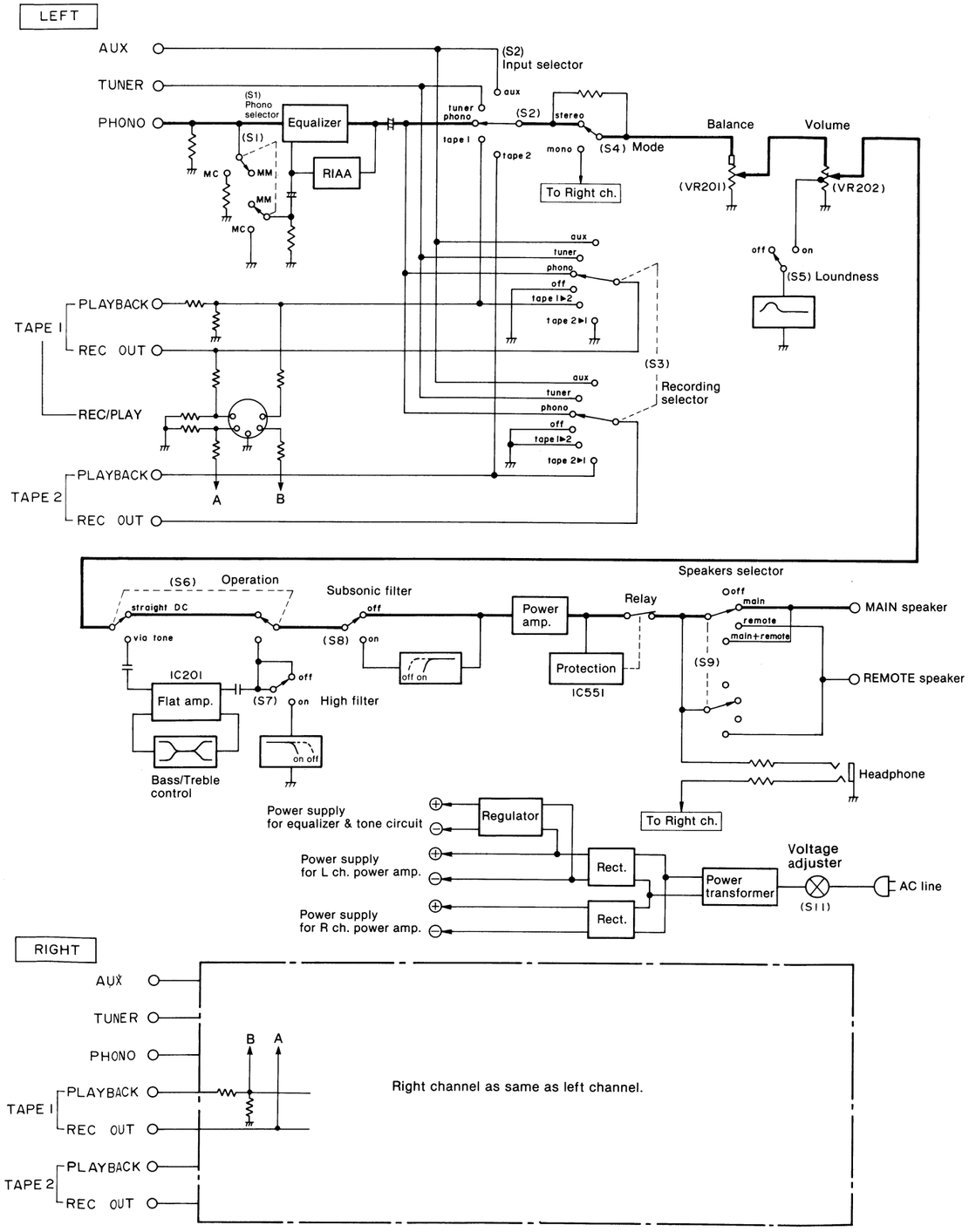
Ref. No.		Part No.	Part Name & Description
INTEGRATED CIRCUITS			
IC101		SVINJM4559DS	IC, Equalizer
IC201		AN6552F	IC, Tone Amplifier
IC551		SVITA7317P	IC, Protection & Operation Amplifier
TRANSISTORS			
Q101~104		2SK170-GR	Transistor, Phono Input Differential Amp. (Use in ranks GR or BL) [FET]
Q301, 302		SVIUPA68H-K	Transistor, Pre Drive Buffer (Use in ranks K or L) [FET]
Q303, 304		2SA995N-G	Transistor, Current Mirror (Use in ranks F or G)
Q305, 306		SVIUPA74V-P	Transistor, Pre Drive Amplifier (Use in ranks P or F)
Q307, 308		2SA921-T	Transistor, Emitter Follower (Use in ranks R, S or T)
Q309, 310, 615 616		2SA1124-R	Transistor, Pre Drive Amplifier (Use in ranks R or S)
Q311, 312, 613, 614		2SC2632-R	Transistor, Pre Drive Amplifier (Use in ranks R or S)
Q451, 452		2SK34-D1	Transistor, Current Stabilizer [FET]
Q453		2SD381A-L9	Transistor, Positive Voltage Control (Use in rands K,L, L9 or M)
Q454		2SB536A-L9	Transistor, Negative Voltage Control (Use in ranks K, L, L9 or M)
Q455, 601, 602		2SC1815-Y	Transistor, Regulator & Current Limiter (Use in ranks Y or O)
Q456, 603, 604		2SA1015-Y	Transistor, Regulator & Current Limiter (Use in ranks Y or O)
Q605~608		2SD661-S	Transistor, Bias Supply (Use in ranks R or S)
Q609~612		2SB745-S	Transistor, Bias Supply (Use in ranks R or S)
Q617, 618		2SC1913-R	Transistor, Drive Amplifier (Use in ranks Q or R)
Q619, 620		2SA913-R	Transistor, Drive Amplifier (Use in ranks Q or R)
Q621, 622		2SD845-R	Transistor, Power Amplifier (Use in ranks R or O)
Q623,624		2SB755-R	Transistor, Power Amplifier (Use in ranks R or O)
DIODES			
D301, 302, 605~608		**MA162A**	Diode, Bias Supply
D303, 304		**MA27A1**	Diode, Bias Supply
D401		LN831RP	Light Emitting Diode, Power Indicator
D402		**MA162A**	Rectifier, Light Emitting Diode
D403, 404	⚠	SVDS4VB20	Rectifier
D451		SVDMZ306A2	Diode, 6V Zener
D551, 601~604		**MA162A**	Diode, Current Limiter
D552		**SVDSR1K2**	Diode, Pulse Cancel
D609~616		**20A90**	Diode, Synchronous Bias Switching

Ref. No.		Part No.	Part Name & Description
COILS and TRANSFORMERS			
L601, 602		SLQY15G-3P	Coil, Power Amplifier Output Choke
T401[XE] only	⚠	SLT5Q109	Transformer, Power
T401[Other Areas]	⚠	SLT5Q109-1	Transformer, Power
VARIABLE RESISTORS			
VR201		EWKK4A085252	Balance Control, 200kΩ (BH)
VR202		EWFNUA026B15	Volume Control, 100kΩ (B)
VR203		EWK35F25C15S	Treble Control, 100kΩ (C)
VR204		EWK36F25C15S	Bass Control, 100kΩ (C)
R353, 354		EVMH9GA00B53	DC Balance Adjustment, 5kΩ(B)
R657~660		EVTR4SA00B13	Clamp Voltage & ICQ Adjustment, 1kΩ(B)
THERMISTERS			
TH601, 602		ERTD2FHL103S	Thermister, Thermal Compensation, 10kΩ
COMPONENT COMBINATIONS			
Z402, 403		EXRFS203ZS	Component Combination, 0.01μF (X2)
FUSES			
F1	⚠	XBA2C05TR0	Fuse, T500mA (250V)
F2	⚠	XBA2C50TR0	Fuse, T5A (250V)
F3	⚠	XBA2C25TR0	Fuse, T2.5A (250V)
RELAY			
RLY1	⚠	SSY69	Relay, Muting & Protection
SWITCHES			
S1		ESD80540	Switch, Phono Selection
S2, 3		ESA2682	Switch, Input & Recording Selection
S4, 5, 7, 8		SSL145	Switch, Low/High Filter, Mode & Loudness
S6		SSL129	Switch, Operation
S9		SSR145	Switch, Speaker Selection
S10	⚠	ESL21210S	Switch, Power Source
S11	⚠	ESE37200	Switch, Voltage Adjuster
LAMP			
PL	⚠	XAMR73S350	Lamp, New Class A Badge, 6.3V 250mA

Areas

- * [D] and [DG] are available in Scandinavia and European except Belgium, United Kingdom, Switzerland, Holland and France.
- * [EB] is available in Belgium.
- * [XE] is available in United Kingdom.
- * [XSW] is available in Switzerland.
- * [XGH] is available in Holland.
- * [XGF] is available in France.
- * [XAL] is available in Australia.
- * [XA] is available in Asia, Latin America, Middle East and Africa.

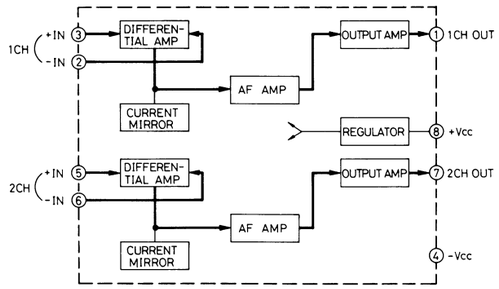
■ BLOCK DIAGRAM



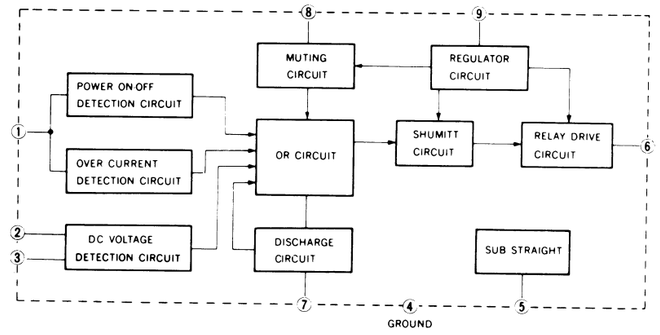
■ BLOCK DIAGRAM OF IC'S

This is the basic block diagram of the inside circuit of IC. In an actual circuit, there may be sometimes idle terminals or some different functions other than the basic circuit.

IC101 (SVINJM4559DS) Equalizer
IC201 (AN6552F) Tone

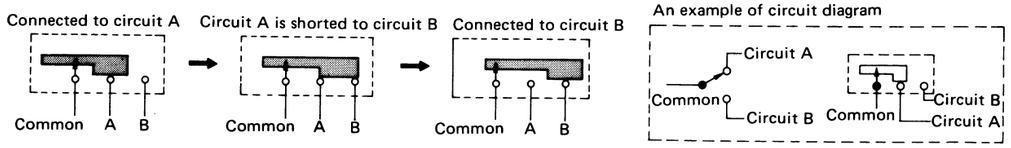


IC551 (SVITA7317P)
Speaker protection & muting



Shorting Switch

This unit uses a shorting switch. As illustrated below, the circuit is shorted to the next circuit without being opened. In the circuit diagram, the shaded area represents the common terminal.



■ SCHEMATIC DIAGRAM

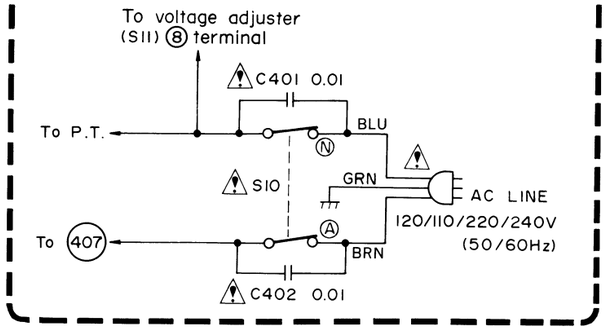
(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

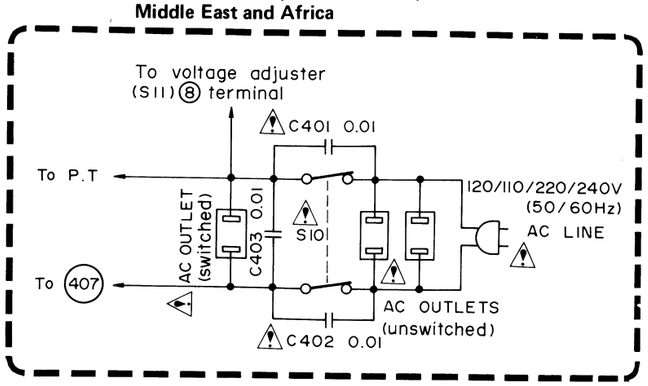
1. **S1**: Phono cartridge selector switch in "**MM**" position. (MM/MC)
2. **S2**: Input selector switch in "**phono**" position. (⑤ tape 2/④ tape 1/③ phono/② tuner/① aux)
3. **S3**: Recording mode selector switch in "**phono**" position. (⑥ tape dubbing 2 ► 1/⑤ tape dubbing 1 ► 2/④ off/③ phono/② tuner/① aux)
4. **S4**: Mode switch in "**stereo**" position. (stereo/mono)
5. **S5**: Loudness switch in "**off**" position.
6. **S6**: Operation selector switch in "**straight DC**" position. (Straight DC/via tone)
7. **S7**: High filter switch in "**off**" position. (off/7kHz [−6dB/oct])
8. **S8**: Subsonic filter switch in "**off**" position. (off/20Hz [−12dB/oct])
9. **S9**: Speakers selector switch in "**main**" position. (① off/② main/③ remote/④ main and remote)
10. **S10**: Power source switch in "**on**" position
11. **S11**: Voltage adjustment switch in "**240V**" position. (240V/220V/110V/120V)
12. ⚠ Indicates that only parts specified by the manufacturer be used for safety.
13. ▭ Indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
14. ⟹ Phono signal lines of left channel
15. ▬ Positive (+ B) voltage lines

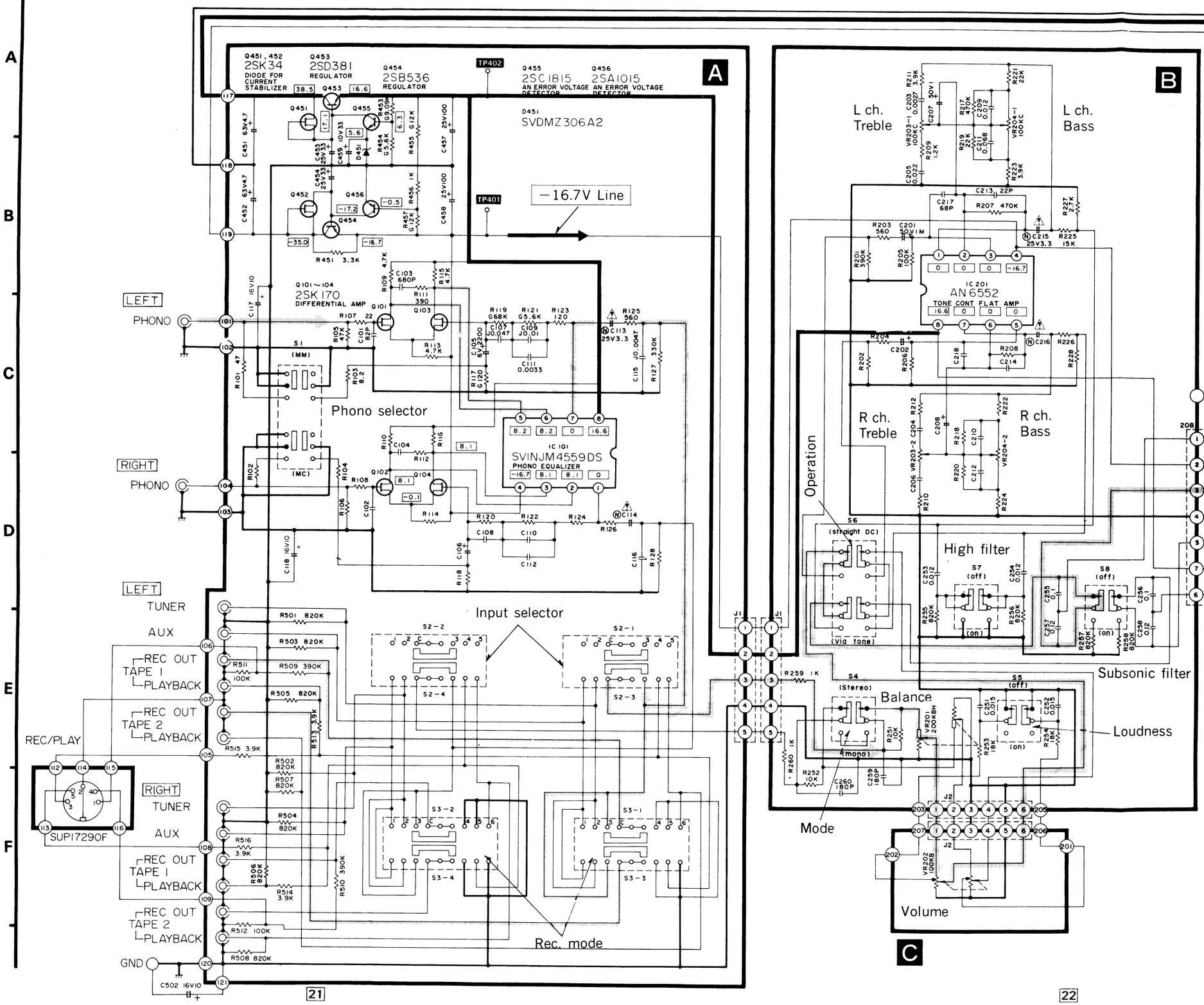
• Power source circuits for [XAL] and [XA]

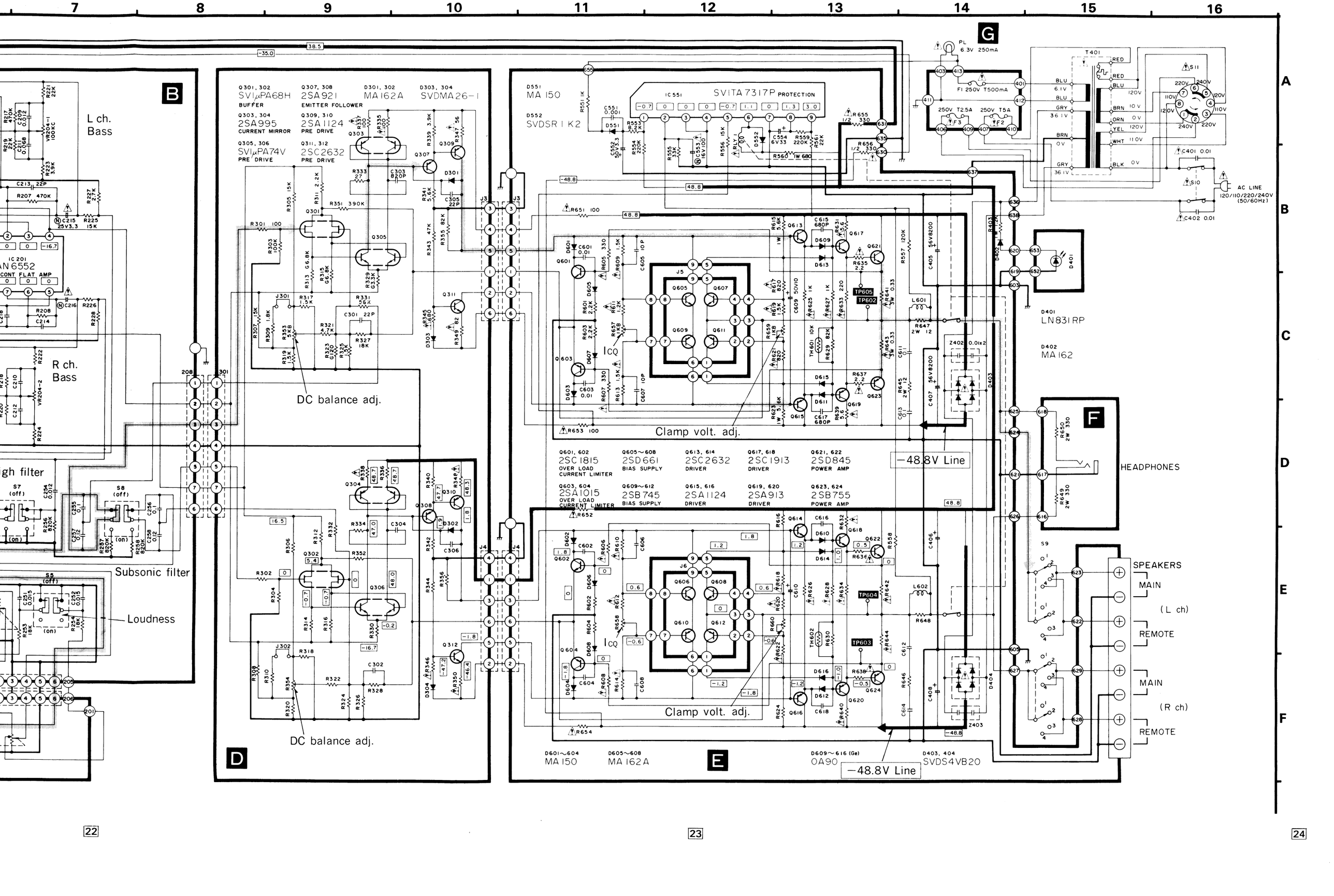
[XAL] ..... Available in Australia



[XA] ..... Available in Asia, Latin America, Middle East and Africa






7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
L ch. Bass
R ch. Bass
High filter
Subsonic filter
Loudness
DC balance adj.
DC balance adj.
Clamp volt. adj.
Clamp volt. adj.
Icq
Icq
Q301, 302 SVIμPA68H BUFFER
Q307, 308 2SA921 EMITTER FOLLOWER
D301, 302 MA162A
D303, 304 SVDMA26-1
Q303, 304 2SA995 CURRENT MIRROR
Q309, 310 2SA1124 PRE DRIVE
Q305, 306 SVIμPA74V PRE DRIVE
Q311, 312 2SC2632 PRE DRIVE
D551 MA150
D552 SVDSR1K2
IC551 SVITA7317P PROTECTION
Q601, 602 2SC1815 OVER LOAD CURRENT LIMITER
Q605~608 2SD661 BIAS SUPPLY
Q613, 614 2SC2632 DRIVER
Q617, 618 2SC1913 DRIVER
Q621, 622 2SD845 POWER AMP
Q603, 604 2SA1015 OVER LOAD CURRENT LIMITER
Q609~612 2SB745 BIAS SUPPLY
Q615, 616 2SA1124 DRIVER
Q619, 620 2SA913 DRIVER
Q623, 624 2SB755 POWER AMP
D601~604 MA150
D605~608 MA162A
D609~616 (Ge) 0A90
D403, 404 SVDS4VB20
D401 LN831RP
D402 MA162
−48.8V Line
−48.8V Line
PL 6.3V 250mA
FI 250V T500mA
250V T2.5A
250V T5A
T401
AC LINE 120/110/220/240V (50/60Hz)
HEADPHONES
SPEAKERS
MAIN (L ch)
REMOTE
MAIN (R ch)
REMOTE

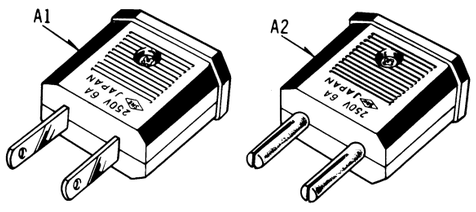
■ REPLACEMENT PARTS LIST.....Cabinet & Chassis Parts

Notes: 1. Part numbers are indicated on most mechanical parts. Pleease use this part number for parts orders.
2. △ indicates that only parts specified by the manufacturer be used for safety.
3. [K]-marked parts are used for black type only, while O-marked parts are for silver type only.
4. Parts other than [K] and O-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. SU-V6 (K)

Ref. No.		Part No.	Part Name & Description
CABINET and CHASSIS PARTS			
1	O	SGWUV6D	Panel, Front Ass'y
1	K	SGWUV6KD	Panel, Front Ass'y (Balck)
2	K	SDU43	Filter, New Class A Badge
3		SHG1481	Cover, Power Indicator
4		SHG6063–1	Rubber Magnet
5		SHG6089	Cover, New Class A Badge
6	O	SDE253	Filter, New Class A Badge
6	K	SDE251	Filter, New Class A Badge
7		SHS6111	Fiber, New Class A Badge
8		SMP281	Holder, New Class A Badge Lamp
9		SHR401–1	Latch, PCB M'tg
10		SHG515	Cushion, Volume Stopper (Rubber)
11	O	SHR5049	Cover, Lever Switch Knobs
11	K	SHR5049–1	Cover, Lever Switch Knobs (Black)
12	O	SBD27	Knob, Lever Switch
12	K	SBD27–1	Knob, Lever Switches (Black)
13	O	SBN855–1	Knob, Volume Control
13	K	SBN899	Knob, Volume Control (Black)
14	O	SBN853	Knob, Balance, Bass, Treble Control
14	K	SBN897	Knob, Balance, Bass, Treble Control (Black)
15	O	SBN857	Knob, Speakers, Rec Selectro, Input Selector & Phono Selector
15	K	SBN901	Knob, Speakers, Rec Selector, Input Selector & Phono Selector (Black)
16		SNE59–1	Washer, Wave Type (Headphones Jack)
17		XCJ6P21B–A	Jack, Headphones
18		SHRA916–1	Latch, Power Indicator PCB M'tg
19		ESA3334B	Remote Control, Input Selector Switch (S2)
20		ESA3333B	Remote Control, Rec. Selectror Switch (S3)
21		ESA3335B	Remote Control, Phono Selector Switch (S1)
22		RJT202B	Terminal, Ground 1 Pin
23		SJF3029–1	Terminal, Input
24		SJP1103	Pin Plug, Phono Input Connection
25		SJF5807–1	Terminal, Speakers
26		SJT215	Terminal, Ground 1 Pin
27 [D, XSW]		SGP1890–1A	Rear Panel
27 [XA]		SGP1890–3A	Rear Panel
27 [XAL]		SGPUV6L	Rear Panel, SGP1890–2A with Name Plate (SGTZ1170)
27 [DG, EB, XE, XGF, XGH]		SGPUV6D	Rear Panel, SGP1890–1A with Name Plate (SGT21130)
28		SJF4101	Terminal, Ground
29 [XA] only	△	SJSA66–2	Socket, AC Outlet
30 [XAL]	△	**QFC1207M**	AC Cord, Power Source (w/Plug)
30 [XSW]	△	SJA111	AC Cord, Power Source (w/Plug)
30 [XE]	△	**QFC1205M**	AC Cord, Power Source
30 [D, DG, XGF, EB, XGH, XA]	△	**SJA97**	AC Cord, Power Source (w/Plug)
31 [XE] only		SFSR5N4	Bushing, AC Cord
31 [XAL] only		SHR131	Bushing, AC Cord
31 [Other Areas]		SFSR4N4	Bushing, AC Cord
32		SHS1009	Fiber, Cabinet
33		SHS6111	Fiber, Cabinet
34	O	SKC110H	Cabinet
34	K	SKC110B	Cabinet (Black)
35		SKU7990	Botton Board
36		SKLA7–1	Foot
37		SJS5703	Socket, 7 Pin Lead Connection
38		SHG6051	Cushion, Cabinet (Rubber)
39		SUW1597	Stopper, Volume Knob
40		SMXA65	Cover, Line Capacitor
41		SJR205	Terminal, 2 Pin (Except for [XA])
42		SUV453	Cover, Voltage Adjuster
43		SJS6509	Socket, Rec/Play (DIN)
44		SHR301	Clamper, Wire
45		SJT347	Holder, Fuse
SCREWS, NUTS and WASHERS			
51		**XTS3+8B**	Screw, Tapping, + 3 x 8 (Front Panel)
52		**XNS8**	Nut, M8 (Volume, Balance, Selector etc.)
53		**XWC8B**	Washer, Toothed Lock, ø8
54		**XWC9B**	Washer, Toothed Lock, ø9
55		**XNS9**	Nut, M9 (Speaker Selector)
56		**XWV9**	Washer, Spring, ø9
57		**XNS12**	Nut, M12 (Headphones Jack)
58		**XTB3+8BFN**	Screw, Tapping, + 3 x 8 (Panel & P.C.B.)
59		**XWC3B**	Washer, Toothed Lock, ø3
60		**XWG3**	Washer, Plain, ø3
61		**XWC6B**	Washer, Toothed Lock, ø6
62		**XNG6E**	Nut, M6 (Ground Terminal)
63		**XTB3+8BFZ**	Screw, Tapping, + 3 x 8 (Rear Panel)
64		**XWC3B**	Washer, Toothed Lock, ø3
65		**XTB3+8BFZ**	Screw, Tapping, + 3 x 8 (Input Terminal)
66	O	**XTB4+8BFN**	Screw, Tapping, + 4 x 8 (Cabinet)
66	K	**XTB4+8BFZ**	Screw, Tapping, + 4 x 8 (Cabinet)
67		**XTB3+8BFN**	Screw, Tapping, + 3 x 8 (Bottom Board)
68		**XTV3+10BFN**	Screw, Tapping, + 3 x 10 (Feet)
69		**XSN3+6BVS**	Screw, + 3 x 6 (Voltage Adjuster & DIN)
70		**XWA3BFZ**	Washer, Spring, ø3
ACCESSORIES			
A1 [XA] only	△	SJP5213–1	Plug Adaptor, AC Power
A2 [XA] only	△	SJP5215–1	Plug Adaptor, AC Power
PACKING PARTS			
P1		SPP651	Polyethylene Bag
P2 [XSW, XE] only		SPS2357–3	Pad, Left Side
P2 [Other Areas]		SPS2357–1	Pad, Left Side
P3 [XSW, XE] only		SPS2357	Pad, Right Side
P3 [Other Areas]		SPS2357–2	Pad, Right Side
P4 [XSW, XE] only		SPS2431	Pad, Corner
P5 [XSW, XE] only		SPG2337	Carton Box
P5 [XGF] only		SPG2325	Carton Box
P5 [Other Areas]	O	SPG2323	Carton Box
P5 [Other Areas]	K	SPG2335	Carton Box (Only for Black Type Model)
P6 [XA] only		SQF10557	Instructions Book, Printed Matter
P6 [Other Areas]		SQF10301	Instructions Book, Printed Matter

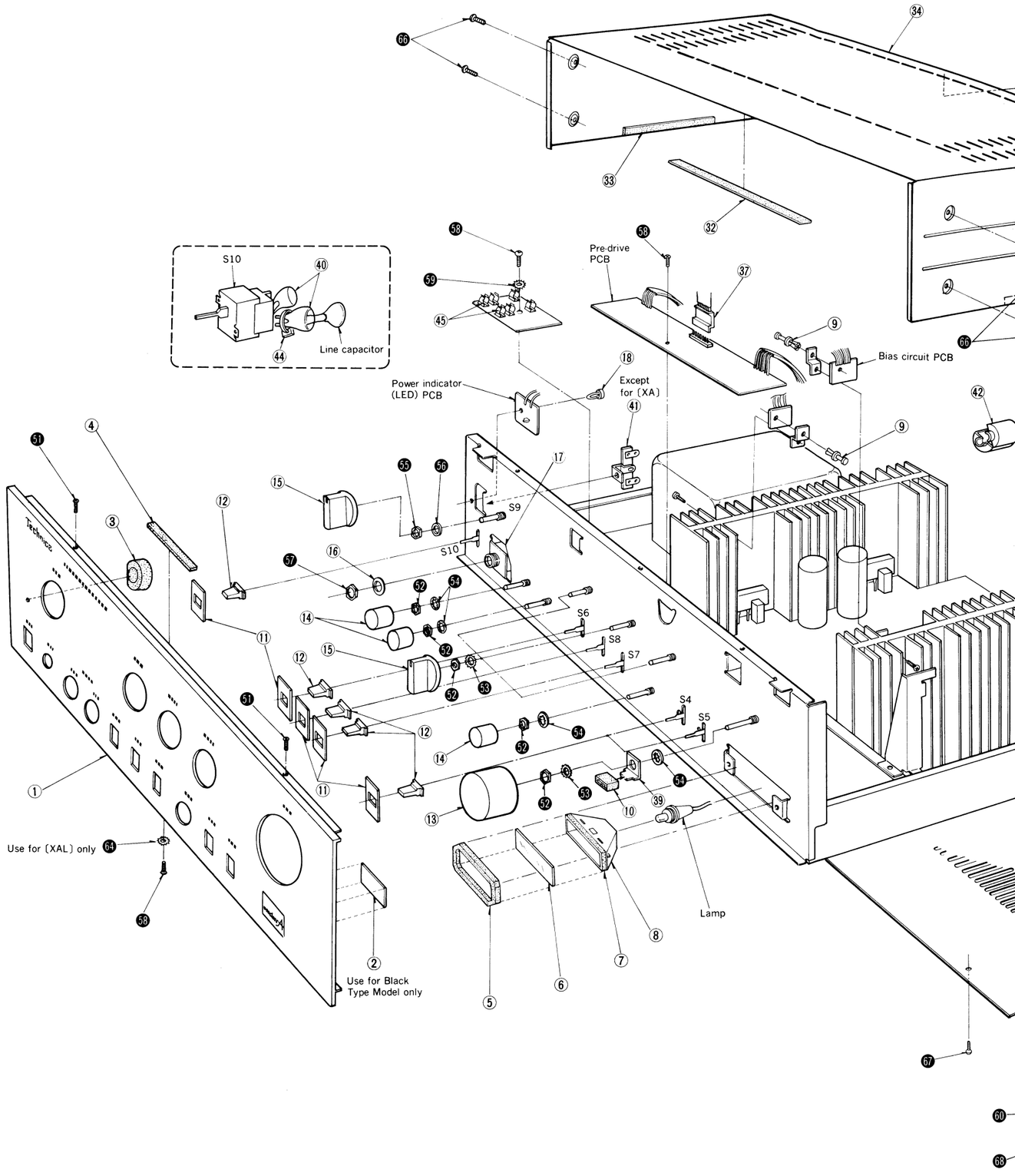
• Accessories

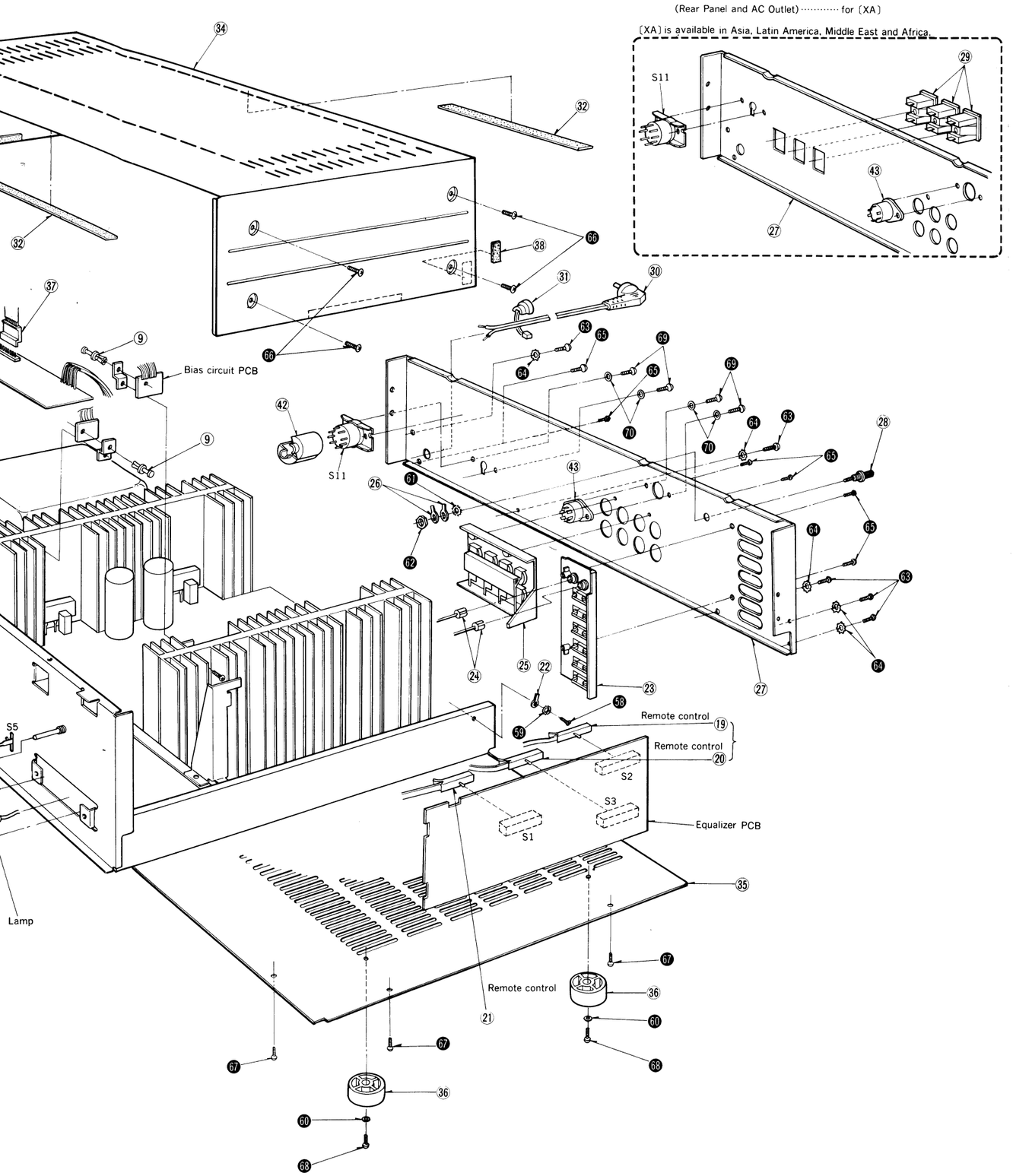


Areas

* [D] and [DG] are available in Scandinavia and European except Belgium, United Kingdom, Switzerland, Holland and France.
* [EB] is available in Belgium.
* [XE] is available in United Kingdom.
* [XSW] is available in Switzerland.
* [XGH] is available in Holland.
* [XGF] is available in France.
* [XAL] is available in Australia.
* [XA] is available in Asia, Latin America, Middle East and Africa.

■ EXPLODED VIEWS





■ SERVICING PRECAUTION

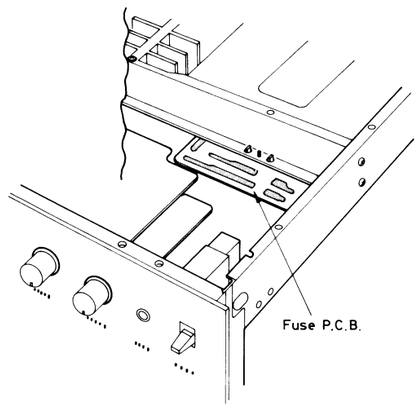


Fig. 1

When installing a removed fuse PCB, remove the bottom board and then install the base so that the line printed on the bottom of the base is parallel with the chassis lug.

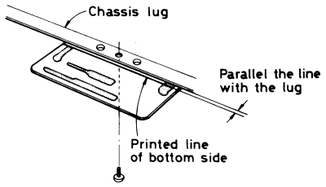


Fig. 2

■ ARRANGEMENTS OF WIRING AFTER REPAIRING

Distortion for the power drive amplifier circuit is delicately affected by the location of wirings. After repairing the circuit, form the lead wires into a loop shape as shown in fig. 3.

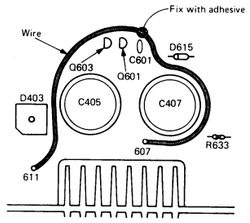


Fig. 3

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